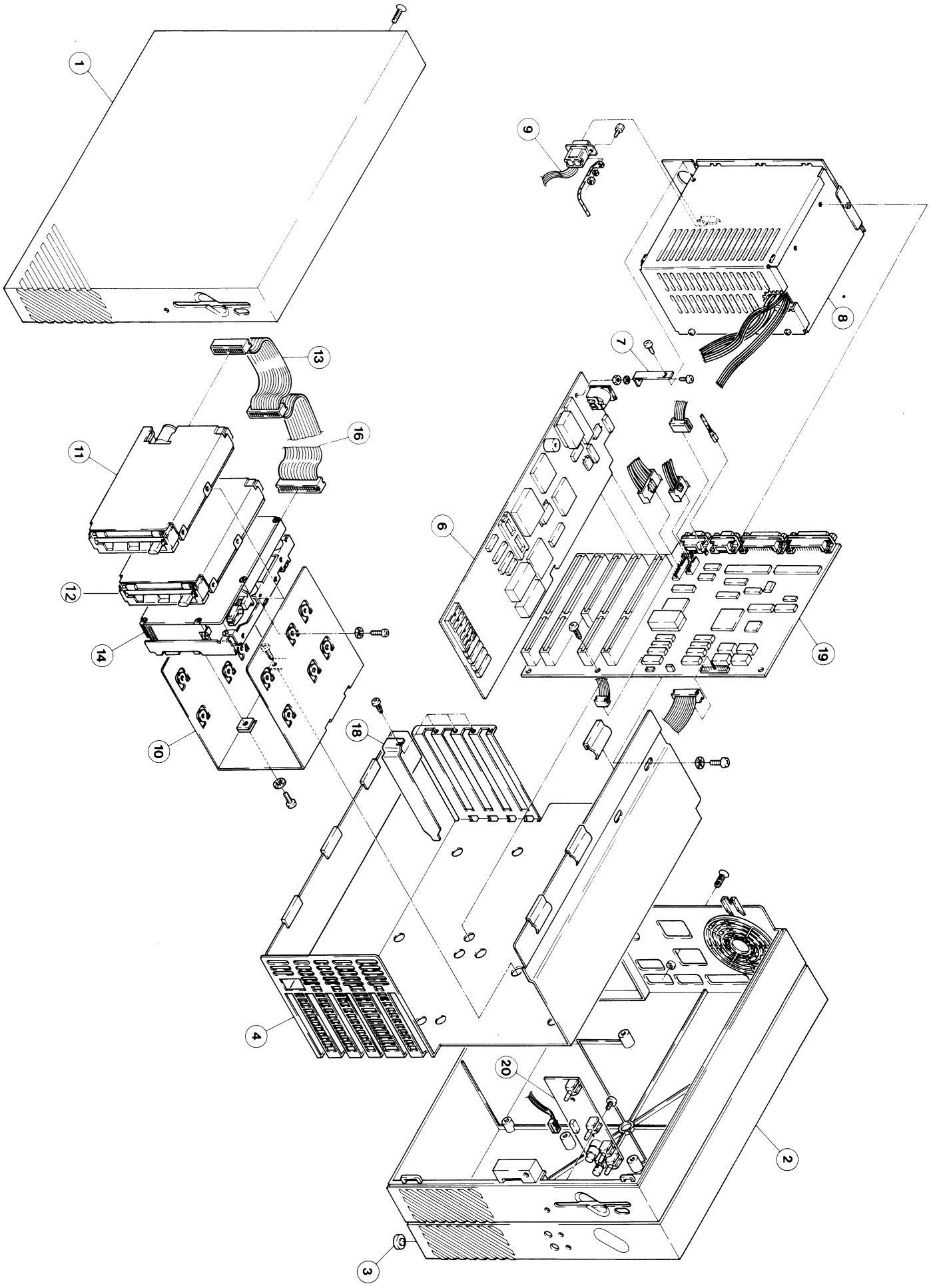
Kundendienst-Handbuch
Service Manual

Schneider

PERSONAL COMPUTER
VGA AT

VGA AT, System 40
VGA AT, System 70

Exploded view



Ersatzteilliste für VGA AT, System 40
Parts List for VGA AT, System 40

Best.-Nr. Part.-No.	Bezeichnung	Description	Zeich.-Pos. Ref.-No.	Preisgruppe
51 558 00	FK System VGA AT	Box system VGA AT		C 3
50 466 00	Sty-Verp. System VGA AT	Polyfoam system VGA AT		C 3
50 495 00	FK Tastatur VGA AT	Box keyboard VGA AT		C 2
50 496 00	Sty-Verp. Tastatur VGA AT	Polyfoam keyboard VGA AT		C 2
50 481 00	Tastatur (D)	Keyboard (D)		F 6
50 482 00	Tastatur (F)	Keyboard (F)		F 6
50 202 00	Tastatur (DK)	Keyboard (DK)		F 6
50 203 00	Tastatur (I)	Keyboard (I)		F 6
50 204 00	Tastatur (N)	Keyboard (N)		F 6
50 485 00	Tastatur (S/SF)	Keyboard (S/SF)		F 6
50 206 00	Tastatur (P)	Keyboard (P)		F 6
50 214 00	Tastatur (GR)	Keyboard (GR)		F 6
50 484 00	Tastatur (GB)	Keyboard (GB)		F 6
50 483 00	Tastatur (E)	Keyboard (E)		F 6
50 486 00	Tastatur (CH)	Keyboard (CH)		F 6
[illegible]0 097 00	Netzkabel (D)	Cord AC (D)		C 0
[illegible]0 562 00	Netzkabel (GB)	Cord AC (GB)		C 0
50 617 00	Netzkabel (CH)	Cord AC (CH)		C 0
50 225 00	Gehäuse Oberteil	Cabinet top	1	C 3
50 226 00	Gehäuse Unterteil	Cabinet bottom	2	C 9
50 493 00	Gehäusefuß	Leg	3	A 5
52 172 00	Blechchassis	Chassis metal	4	D 4
50 503 00	Platine Best. (D) AT 260 CPU	PCB (D) AT 260 CPU	6	*
50 293 00	Haltewinkel CPU Leiterplatte	Angle CPU	7	A 9
51 537 00	Netzteil 90 W	Power supply 90 W	8	G 6
50 448 00	Kabelbaum 9pol.	Cable 9-pin	9	B 8
50 171 00	Floppyhalter	Bracket floppy	10	B 8
50 021 00	Floppy Laufwerk	Floppy disk drive	11	G 0
50 472 00	Floppy Laufwerk	Floppy disk drive	12	F 8
50 221 00	Kabelbaum Floppy 26pol.	Cable floppy 26-pin	13	B 7
51 550 00	Hard Disk Laufwerk 40 MB	Hard disk drive 40 MB	14	*
51 444 00	HD-Kabel	Cable HD	16	C 0
50 224 00	Blindblende	Plate blind	17	A 9
50 020 00	Blindblech	Plate blind	18	B 9
50 925 00	Platine Best. (D) VGA I/0	PCB (D) VGA I/0	19	J 5
51 534 00	Platine Best. LED-Panel	PCB LED-Panel	20	C 7
50 056 00	Druckknopf f. FDD (Toshiba)	Push-button, FDD (Toshiba)		A 5
50 294 00	Druckknopf f. FDD (Sony)	Push-button, FDD (Sony)		A 5
51 458 00	Adapterkabel HD, 4pol.	Cable, HD 4-pin		B 4
51 447 00	Kabelbaum LED-Panel	Cable, LED-Panel		B 3

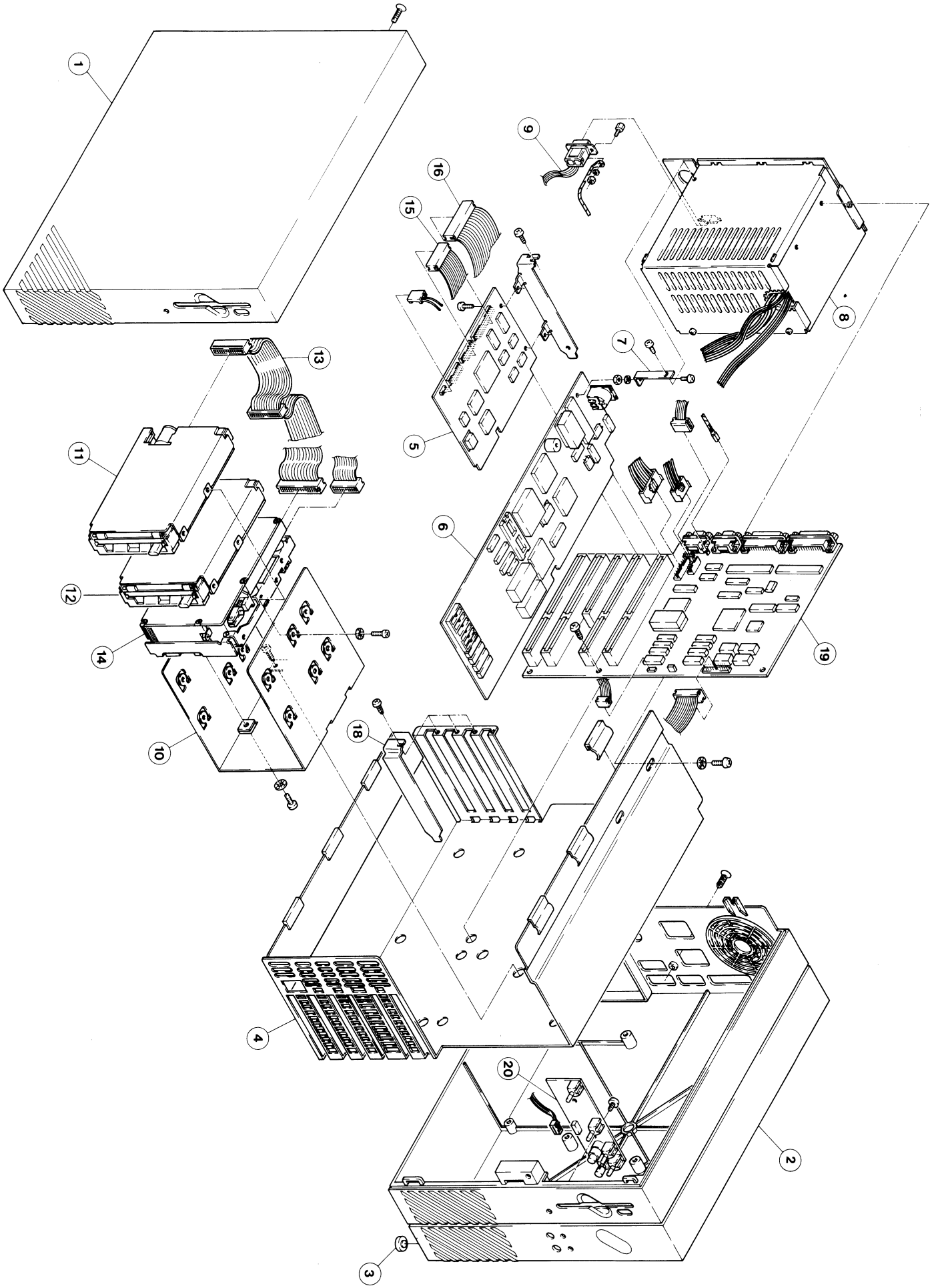
Note: All spare parts with countryindex are reserved for foreign distributors only.

All 3.5″ and 5.25″ floppydisks must be replaced by new ones. Schneider passes no exchange price to the distributor or dealer.

* Preis auf Anfrage

* Please call for price

Exploded view



Ersatzteilliste für VGA AT, System 70
Parts List for VGA AT, System 70

Best.-Nr. Part.-No.	Bezeichnung	Description	Zeich.-Pos. Ref.-No.	Preisgruppe
51 558 00	FK System VGA AT	Box system VGA AT		C 3
50 466 00	Sty-Verp. System VGA AT	Polyfoam system VGA AT		C 3
50 495 00	FK Tastatur VGA AT	Box keyboard VGA AT		C 2
50 496 00	Sty-Verp. Tastatur VGA AT	Polyfoam keyboard VGA AT		C 2
50 481 00	Tastatur (D)	Keyboard (D)		F 6
50 482 00	Tastatur (F)	Keyboard (F)		F 6
50 202 00	Tastatur (DK)	Keyboard (DK)		F 6
50 203 00	Tastatur (I)	Keyboard (I)		F 6
50 204 00	Tastatur (N)	Keyboard (N)		F 6
50 485 00	Tastatur (S/SF)	Keyboard (S/SF)		F 6
50 206 00	Tastatur (P)	Keyboard (P)		F 6
50 214 00	Tastatur (GR)	Keyboard (GR)		F 6
50 484 00	Tastatur (GB)	Keyboard (GB)		F 6
50 483 00	Tastatur (E)	Keyboard (E)		F 6
50 486 00	Tastatur (CH)	Keyboard (CH)		F 6
50 097 00	Netzkabel (D)	Cord AC (D)		C 0
0 562 00	Netzkabel (GB)	Cord AC (GB)		C 0
50 617 00	Netzkabel (CH)	Cord AC (CH)		C 0
50 225 00	Gehäuse Oberteil	Cabinet top	1	C 3
50 226 00	Gehäuse Unterteil	Cabinet bottom	2	C 9
50 493 00	Gehäusefuß	Leg	3	A 5
52 172 00	Blechchassis	Chassis metal	4	D 4
50 502 00	HD Controller	HD Controller	5	H 1
50 503 00	Platine Best. (D) AT CPU	PCB (D) AT CPU	6	*
50 293 00	Haltewinkel CPU Leiterplatte	Angle CPU	7	A 9
51 537 00	Netzteil 90 W	Power supply 90 W	8	G 6
50 448 00	Kabelbaum 9pol.	Cable 9-pin	9	B 8
50 171 00	Floppyhalter	Bracket floppy	10	B 8
50 021 00	Floppy Laufwerk	Floppy disk drive	11	G 0
50 472 00	Floppy Laufwerk	Floppy disk drive	12	F 8
50 221 00	Kabelbaum Floppy 26pol.	Cable floppy 26-pin	13	B 7
50 469 00	Hard Disk Laufwerk 63 MB	Hard disk drive 63 MB	14	*
50 220 00	Kabelbaum 20pol.	Cable 20-pin	15	B 9
50 223 00	Kabelbaum 34pol.	Cable 34-pin	16	C 5
50 224 00	Blindblende	Plate blind	17	A 9
50 020 00	Blindblech	Plate blind	18	B 9
50 925 00	Platine Best. (D) VGA I/0	PCB (D) VGA I/0	19	J 5
51 534 00	Platine Best. LED-Panel	PCB LED-Panel	20	C 7
50 056 00	Druckknopf f. FDD (Toshiba)	Push-button, FDD (Toshiba)		A 5
50 294 00	Druckknopf f. FDD (Sony)	Push-button, FDD (Sony)		A 5
51 458 00	Adapterkabel HD, 4pol.	Cable, HD 4-pin		B 4
1 447 00	Kabelbaum LED-Panel	Cable, LED-Panel		B 3

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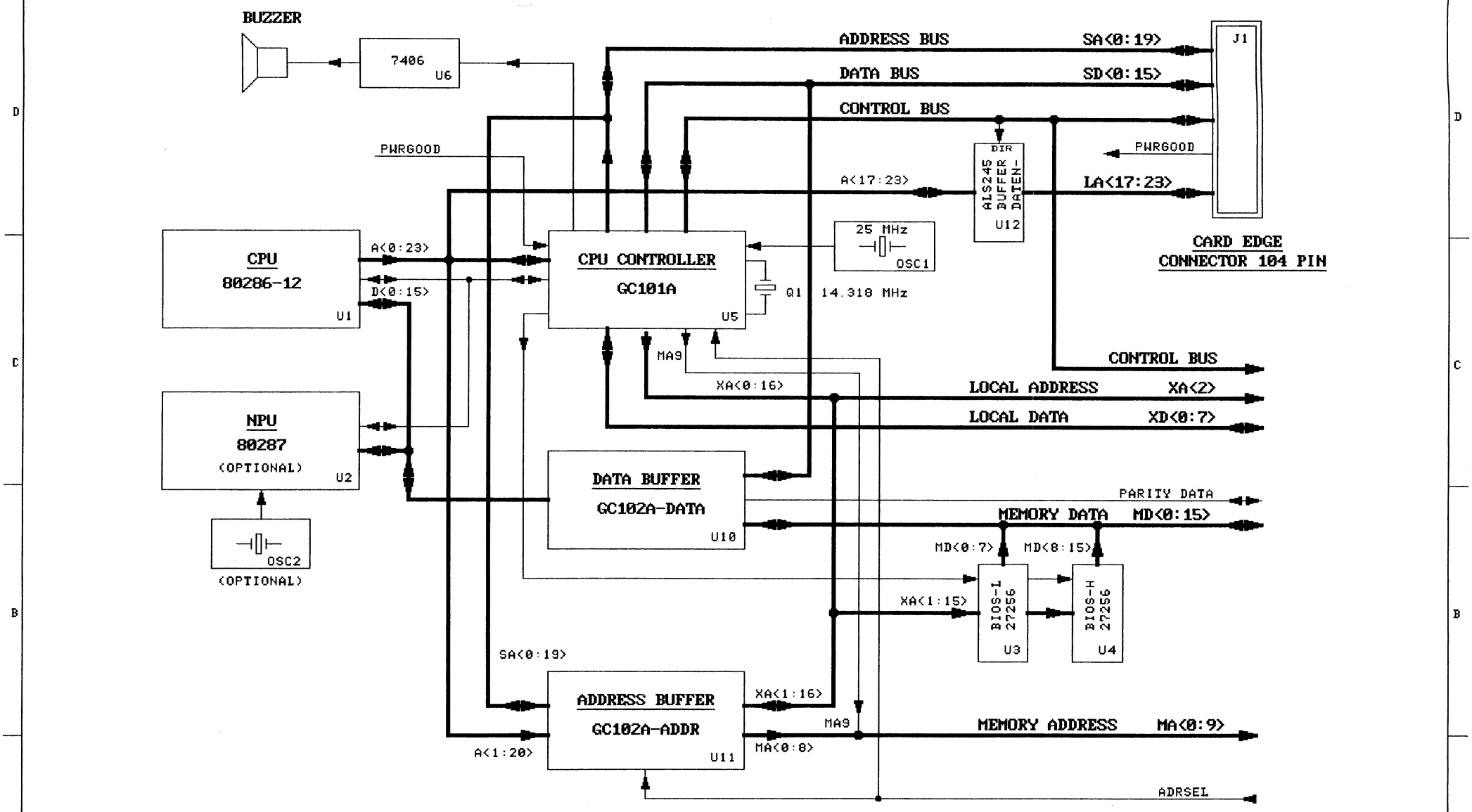
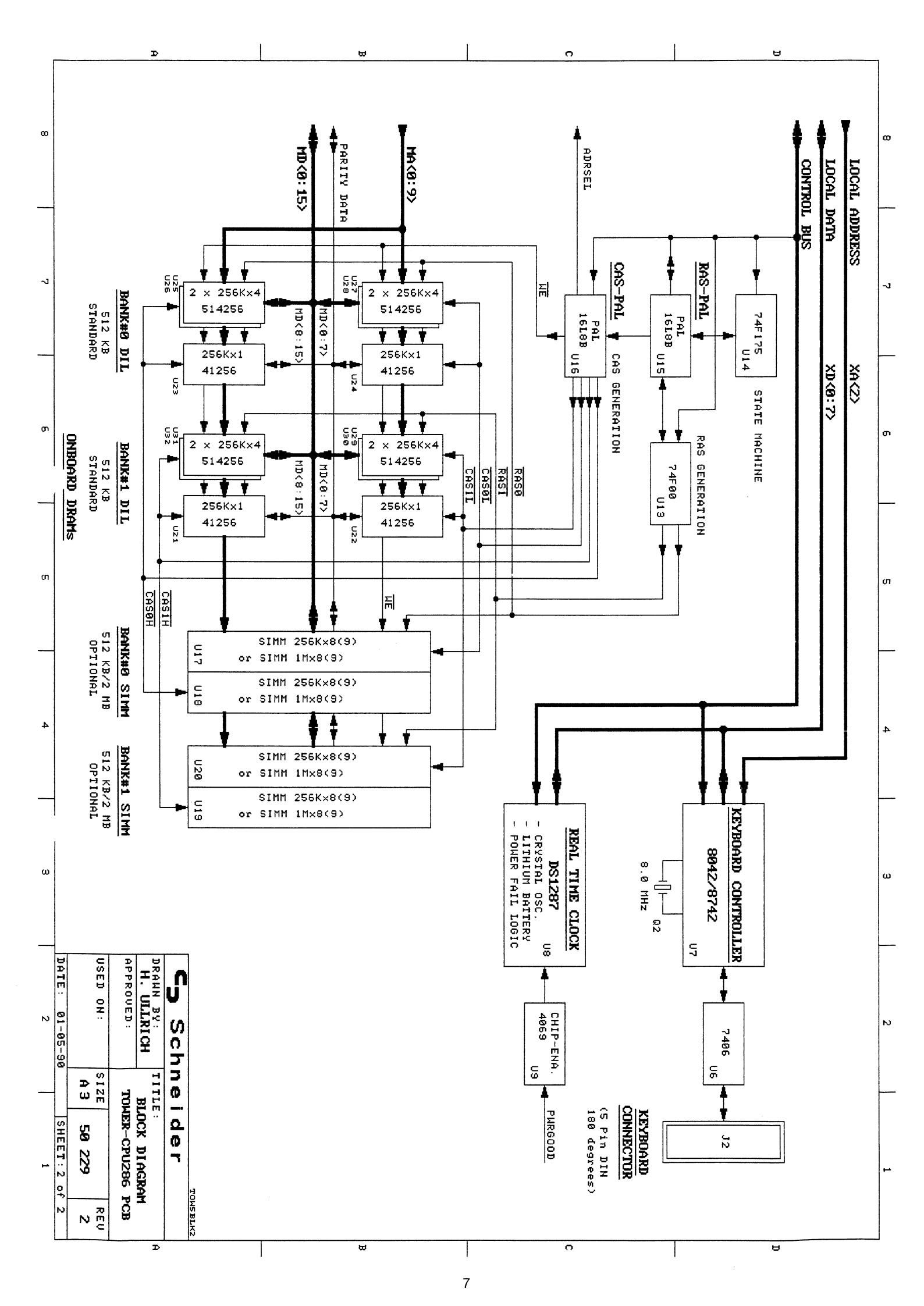


TOW5BLK1

Schneider

DRAWN BY: H. ULLRICH	TITLE: BLOCK DIAGRAM TOWER-CPU286 PCB		
APPROVED:			
USED ON:	SIZE A3	50 229	REV 2
DATE: 01-05-90	SHEET: 1 of 2		


LOCAL ADDRESS
XA<2>
LOCAL DATA
XD<0:7>
CONTROL BUS
MD<0:15>
PARITY DATA
MA<0:9>
ADRSEL
WE
RAS-PAL
CAS-PAL
PAL 16L8B U15
PAL 16L8B U16
74F175 U14
STATE MACHINE
CAS GENERATION
RAS GENERATION
74F00 U13
RAS0
RAS1
CAS0L
CAS1L
CAS0H
CAS1H
BANK#0 DIL
512 KB STANDARD
BANK#1 DIL
512 KB STANDARD
ONBOARD DRAMs
2 x 256Kx4 514256
256Kx1 41256
U21
U22
U23
U24
U25
U26
U27
U28
U29
U30
U31
U32
BANK#0 SIMM
512 KB/2 MB OPTIONAL
BANK#1 SIMM
512 KB/2 MB OPTIONAL
SIMM 256Kx8(9) or SIMM 1Mx8(9)
U17
U18
U19
U20
KEYBOARD CONTROLLER
8042/8742 U7
8.0 MHz
Q2
REAL TIME CLOCK
DS1287 U8
- CRYSTAL OSC.
- LITHIUM BATTERY
- POWER FAIL LOGIC
CHIP-ENA. 4069 U9
7406 U6
PWRGOOD
KEYBOARD CONNECTOR
(5 Pin DIN 180 degrees)
J2
Schneider
DRAWN BY: H. ULLRICH
APPROVED:
USED ON:
TITLE: BLOCK DIAGRAM TOWER-CPU286 PCB
SIZE A3
50 229
REV 2
DATE: 01-05-90
SHEET: 2 of 2
TOWS BLK2

REVISIONS

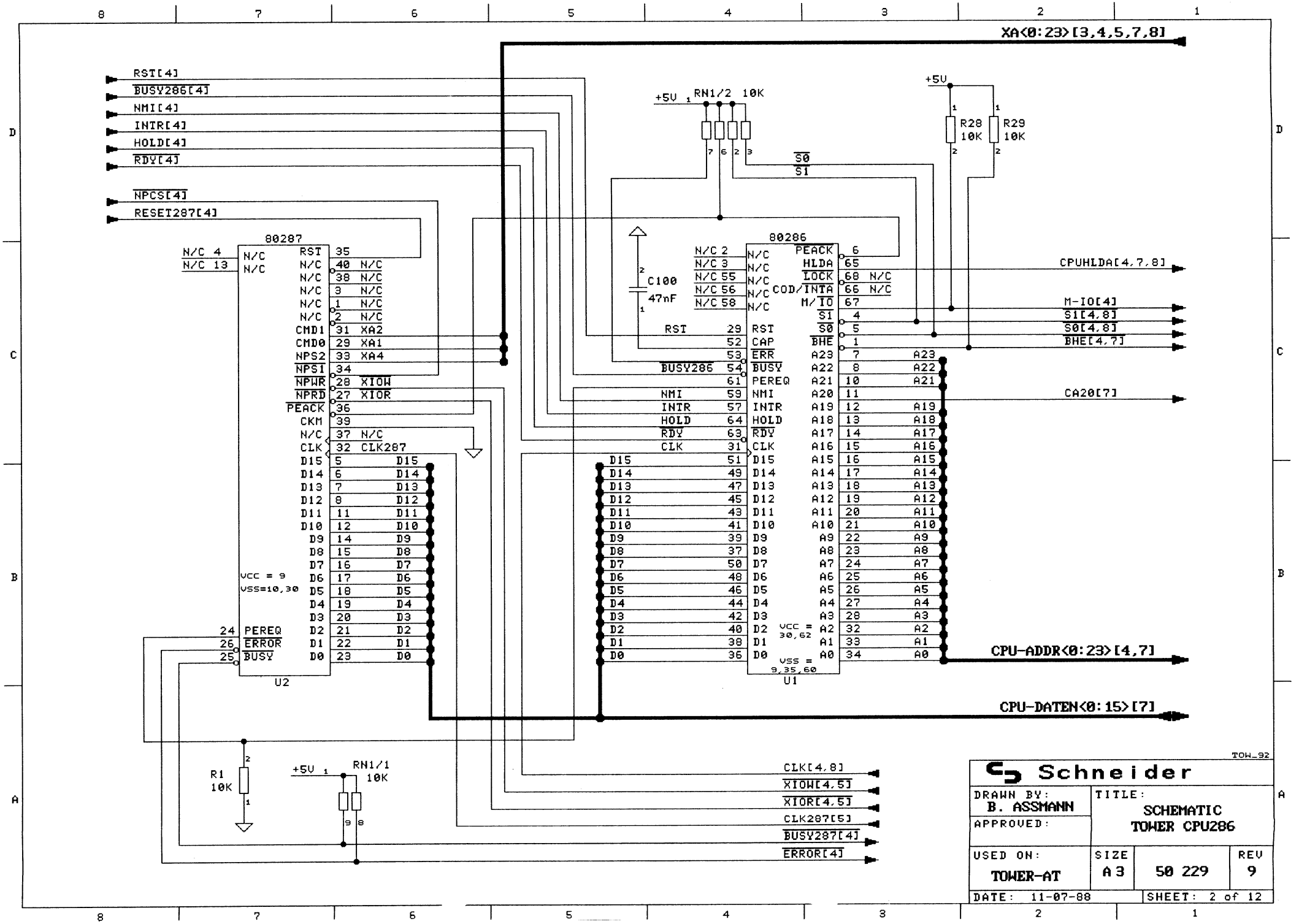
LTR	DESCRIPTION	DATE	APPROVED
1	ADVANCED ENGINEERING RELEASE	05-13-88	SCHLAGE
2		05-18-88	ASSMANN
3		06-01-88	SCHLAGE
4	First Layout	06-22-88	SCHLAGE
5	Layout REV 2	08-06-88	ASSMANN
6	Layout REV 2 CORRECTIONS	08-22-88	ASSMANN
7	PCB REV 2A FIX OF BUS '/MASTER'	08-31-88	ASSMANN
8	PCB REV 4. LAYOUT: ADDITIONAL RESET LOGIC ELIMINATED	11-02-88	ULLRICH
9	PCB REV 5. LAYOUT: WITH GC 101 D	11-07-88	ASSMANN

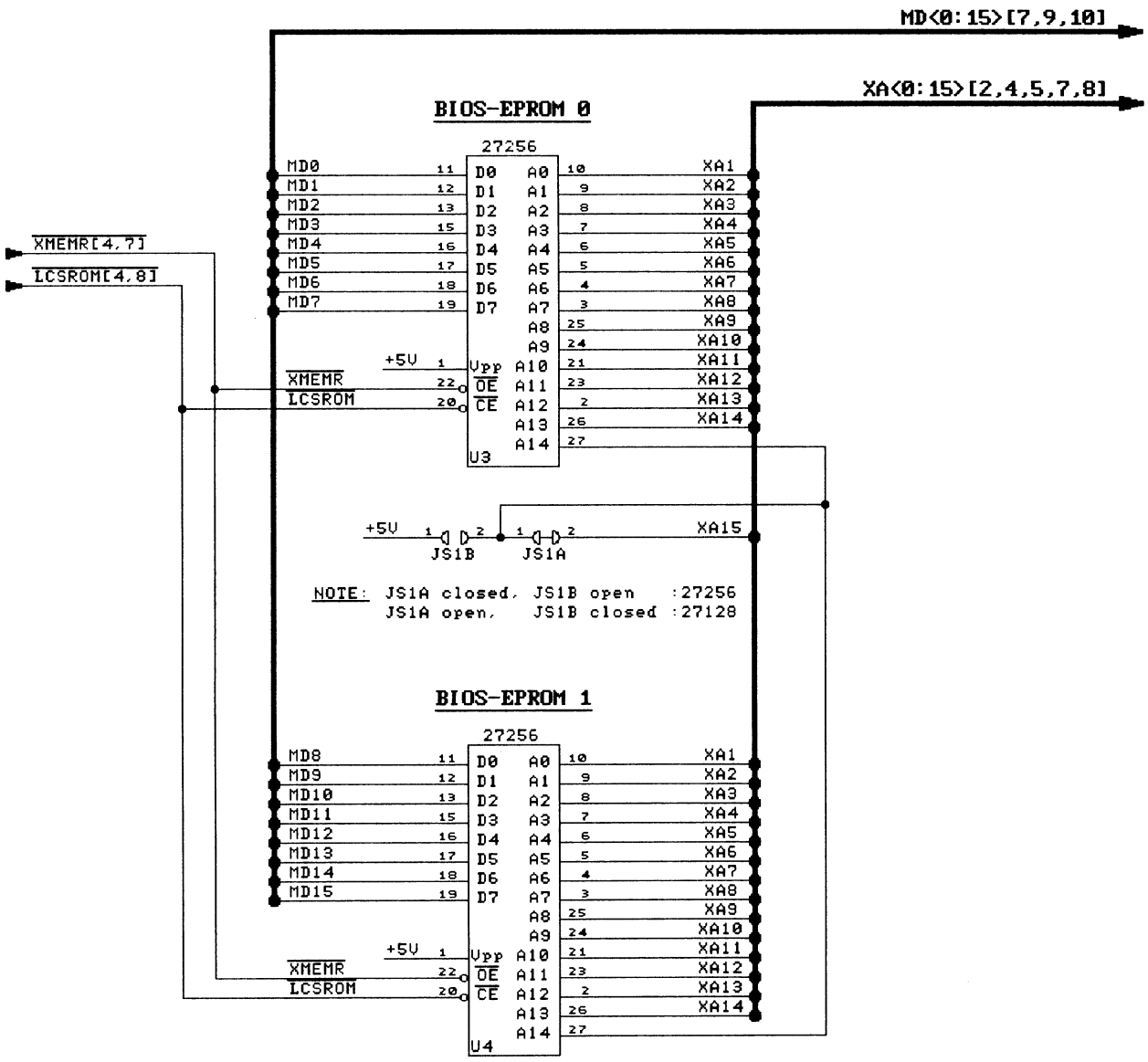
DRAWING FILES:	CONTENTS:
TOW_91.DWG	THIS SHEET
TOW_92.DWG	CPU SECTION
TOW_93.DWG	BIOS EPROMS
TOW_94.DWG	GC 101 D
TOW_95.DWG	KEYBOARD / CLOCKS
TOW_96.DWG	REAL TIME CLOCK
TOW_97.DWG	ADDRESS / DATA BUFFERS
TOW_98.DWG	TIMING FOR MEMORY
TOW_99.DWG	MEMORY ON SIL- MODULE
TOW_910.DWG	MEMORY ON BOARD
TOW_911.DWG	CONNECTORS
TOW_912.DWG	BLOCK CAPS

TOW_91

Schneider

DRAWN BY: B. ASSMANN	TITLE: SCHEMATICS TOWER CPU286		
APPROVED:			
USED ON: TOWER-AT	SIZE A3	50 229	REV 9
DATE: 11-07-88	SHEET: 1 of 12		

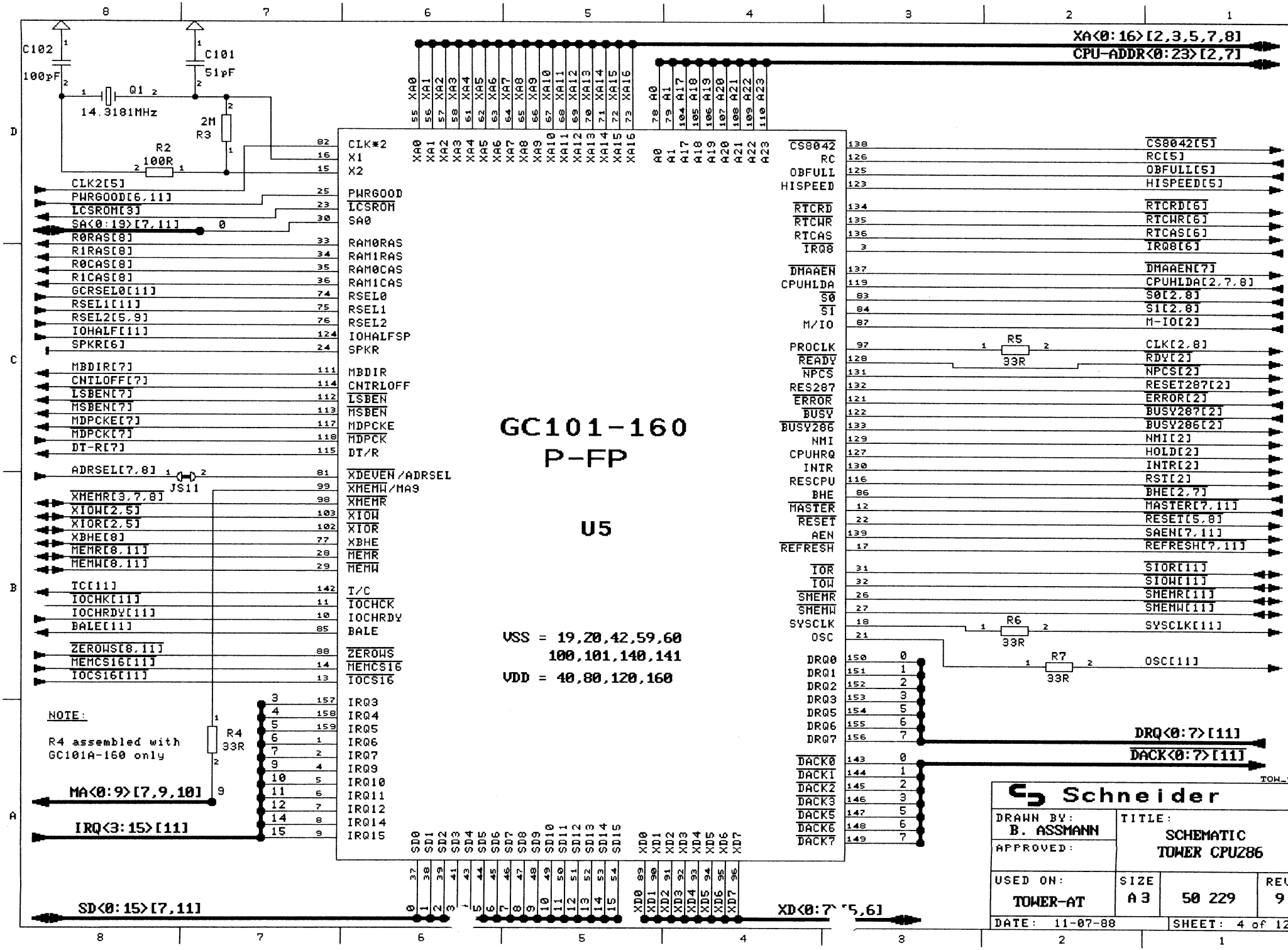

XA<0:23>[3,4,5,7,8]
RST[4]
BUSY286[4]
NMI[4]
INTR[4]
HOLD[4]
RDY[4]
NPCS[4]
RESET287[4]
80287
80286
U2
U1
RN1/2 10K
+5V
R28 10K
R29 10K
C100 47nF
S0
S1
CPUHLDA[4,7,8]
M-IO[4]
S1[4,8]
S0[4,8]
BHE[4,7]
CA20[7]
CPU-ADDR<0:23>[4,7]
CPU-DATEN<0:15>[7]
VCC = 9
VSS=10,30
VCC = 30,62
VSS = 9,35,60
R1 10K
RN1/1 10K
CLK[4,8]
XIOW[4,5]
XIOR[4,5]
CLK287[5]
BUSY287[4]
ERROR[4]
TOW_92
Schneider
DRAWN BY: B. ASSMANN
APPROVED:
TITLE: SCHEMATIC TOWER CPU286
USED ON: TOWER-AT
SIZE A3
50 229
REV 9
DATE: 11-07-88
SHEET: 2 of 12

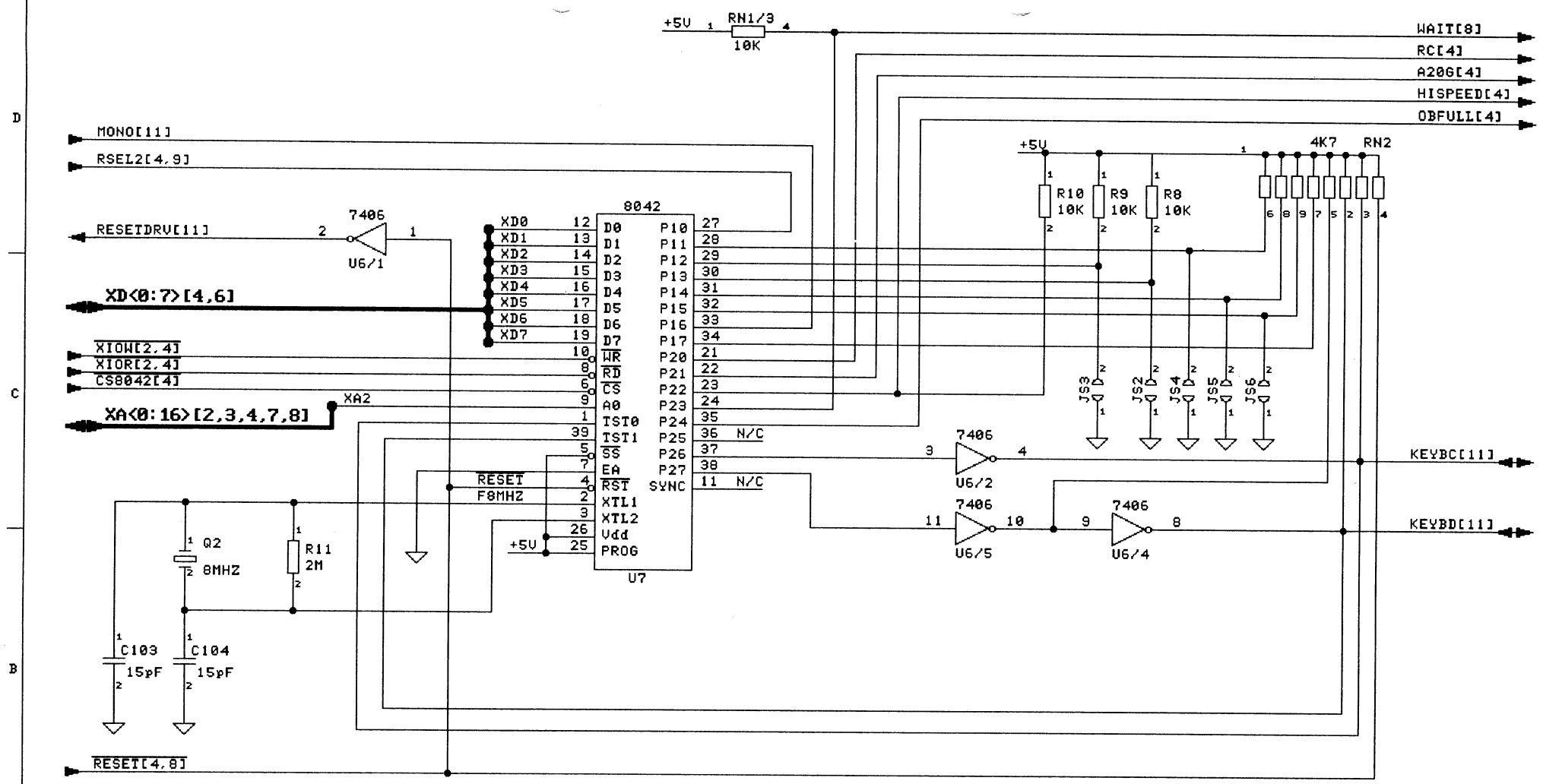


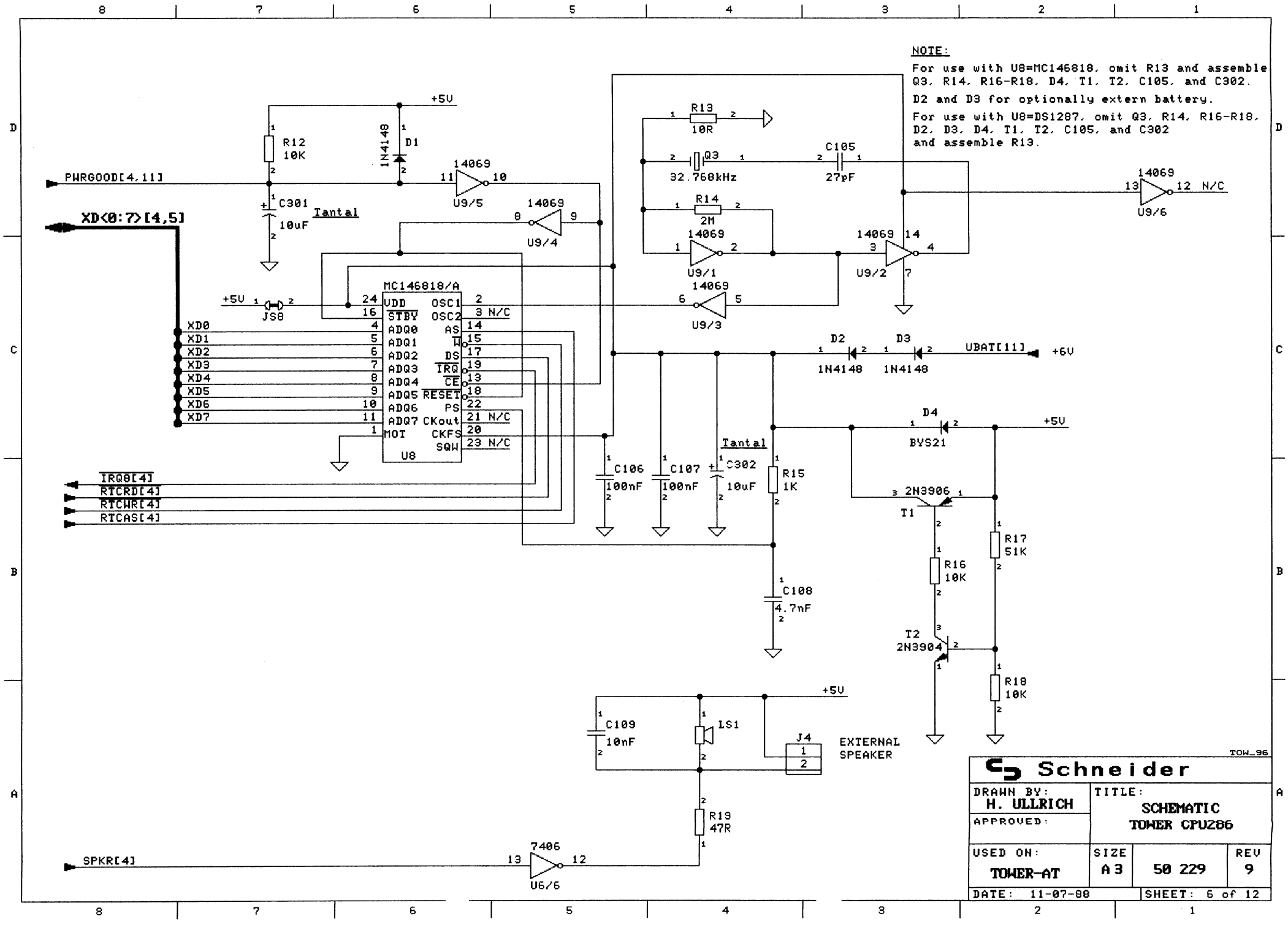
TOW_93

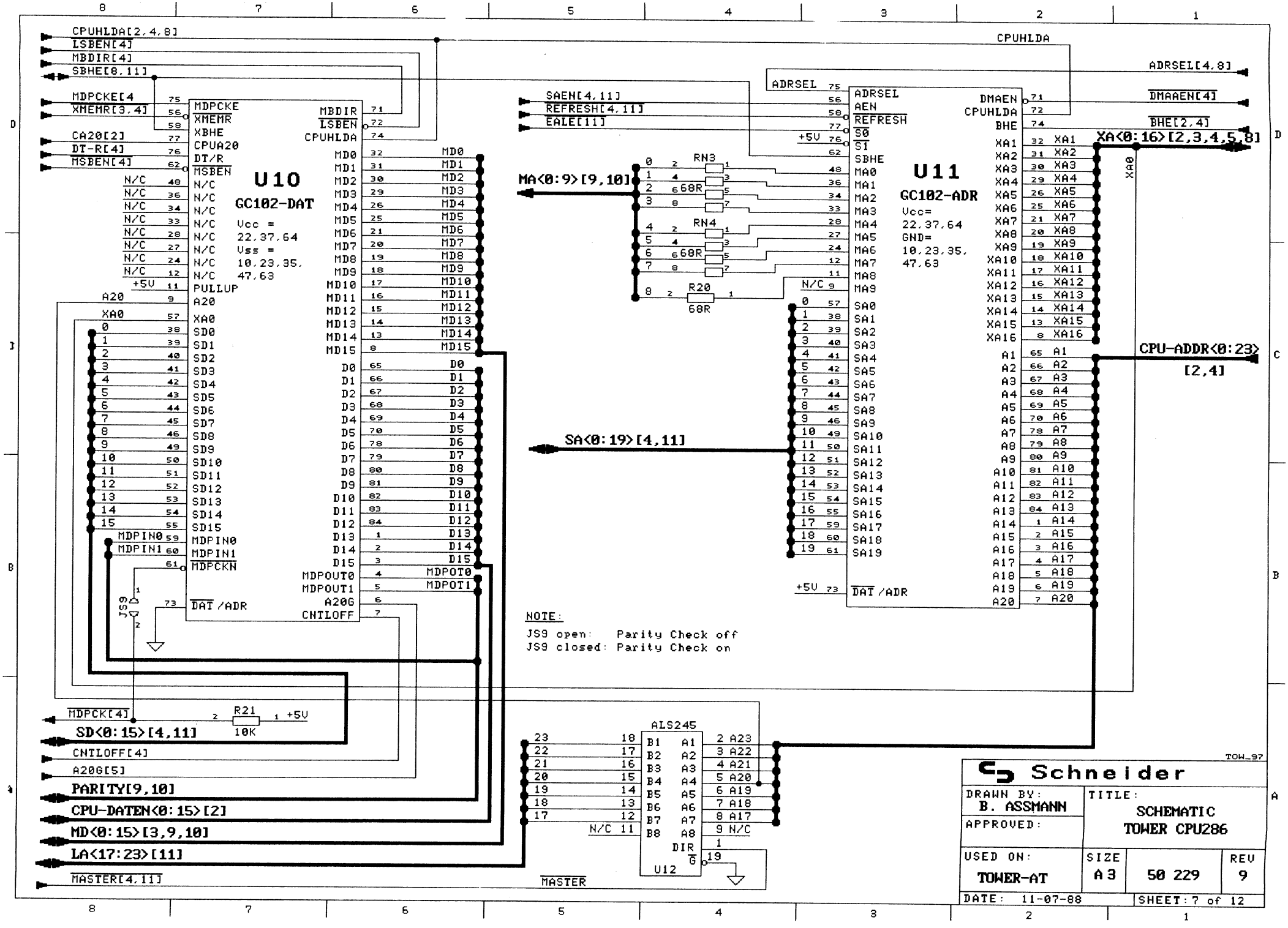
Schneider

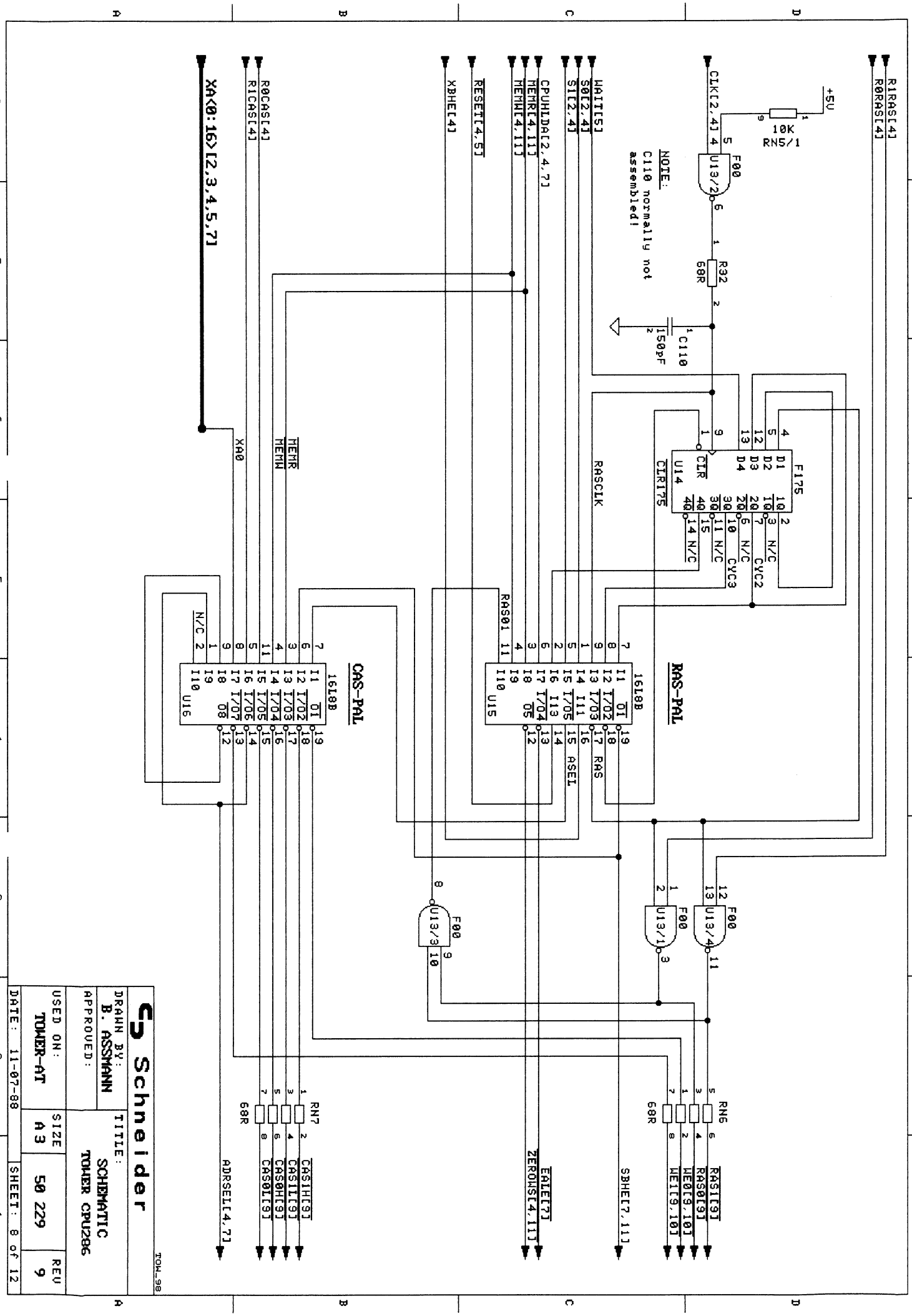
DRAWN BY: B.ASSMANN	TITLE: SCHEMATIC TOWER CPU286		
APPROVED:			
USED ON: TOWER-AT	SIZE A3	50 229	REV 9
DATE: 11-07-88	SHEET: 3 of 12		


C102
100pF
C101
51pF
Q1
14.3181MHz
2M
R3
R2
100R
XA<0:16>[2,3,5,7,8]
CPU-ADDR<0:23>[2,7]
GC101-160
P-FP
U5
VSS = 19,20,42,59,60
100,101,140,141
VDD = 40,80,120,160
R5
33R
R6
33R
R7
33R
JS11
R4
33R
NOTE:
R4 assembled with
GC101A-160 only
MA<0:9>[7,9,10]
IRQ<3:15>[11]
SD<0:15>[7,11]
XD<0:7>[5,6]
DRQ<0:7>[11]
DACK<0:7>[11]
TOW_94
Schneider
DRAWN BY:
B. ASSMANN
APPROVED:
TITLE:
SCHEMATIC
TOWER CPUZ86
USED ON:
TOWER-AT
SIZE
A 3
50 229
REV
9
DATE: 11-07-88
SHEET: 4 of 12


+5V
RN1/3
10K
WAIT[8]
RC[4]
A20G[4]
HISPEED[4]
OBFULL[4]
MONO[11]
RSEL2[4,9]
RESETDRV[11]
7406
U6/1
XD<0:7>[4,6]
XIOW[2,4]
XIOR[2,4]
CS8042[4]
XA<0:16>[2,3,4,7,8]
XA2
RESET[4,8]
8042
XD0
XD1
XD2
XD3
XD4
XD5
XD6
XD7
D0
D1
D2
D3
D4
D5
D6
D7
WR
RD
CS
A0
TST0
TST1
SS
EA
RST
XTL1
XTL2
Vdd
PROG
P10
P11
P12
P13
P14
P15
P16
P17
P20
P21
P22
P23
P24
P25
P26
P27
SYNC
N/C
U7
RESET
F8MHZ
Q2
8MHZ
R11
2M
C103
15pF
C104
15pF
4K7
RN2
R10
10K
R9
10K
R8
10K
JS3
JS2
JS4
JS5
JS6
U6/2
U6/5
U6/4
KEYBC[11]
KEYBD[11]
OSC1
20MHz
OSC2
24MHz
spare
20 MHz
24 MHz
JS7A
JS7B
CLK2[2]
JU1
CLK287[2]
NOTE:
OSC1 for 10 MHz 80286
and 6 MHz 80287
NOTE:
OSC2 optionally for 8 MHz 80287
NOTE:
JS7A closed, JS7B open : 10 MHz 80286
JS7A open, JS7B closed: 12 MHz 80286
NOTE:
JU1 1-2: 6 MHz 80287
JU1 2-3: 8 MHz 80287
TOW_95
Schneider
DRAWN BY: H.ULLRICH
APPROVED:
TITLE: SCHEMATIC TOWER CPU286
USED ON: TOWER-AT
SIZE A3
50 229
REV 9
DATE: 11-07-88
SHEET: 5 of 12

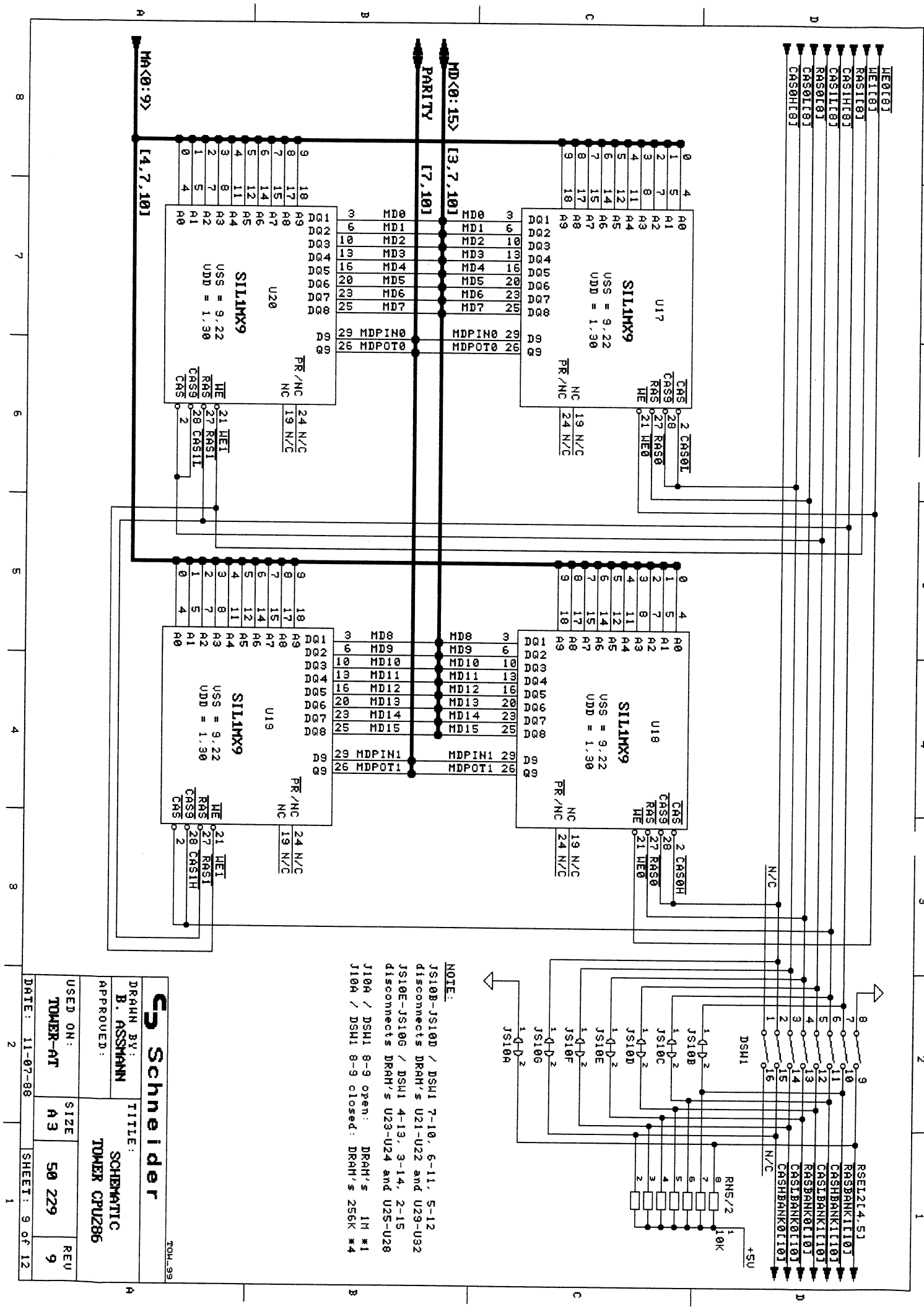

NOTE:
For use with U8=MC146818, omit R13 and assemble Q3, R14, R16-R18, D4, T1, T2, C105, and C302.
D2 and D3 for optionally extern battery.
For use with U8=DS1287, omit Q3, R14, R16-R18, D2, D3, D4, T1, T2, C105, and C302 and assemble R13.
PWRGOOD[4,11]
XD<0:7>[4,5]
+5V
R12 10K
1N4148 D1
C301 10uF Tantal
14069 U9/5
14069 U9/4
MC146818/A
U8
XD0
XD1
XD2
XD3
XD4
XD5
XD6
XD7
IRQ8[4]
RTCRD[4]
RTCWR[4]
RTCAS[4]
JS8
R13 10R
Q3 32.768kHz
C105 27pF
R14 2M
14069 U9/1
14069 U9/2
14069 U9/3
14069 U9/6
D2 1N4148
D3 1N4148
UBAT[1]
+6V
D4 BYS21
C106 100nF
C107 100nF
C302 10uF Tantal
R15 1K
C108 4.7nF
T1 2N3906
T2 2N3904
R16 10K
R17 51K
R18 10K
C109 10nF
LS1
J4
EXTERNAL SPEAKER
R19 47R
7406 U6/6
SPKR[4]
TOW_96
Schneider
DRAWN BY: H. ULLRICH
APPROVED:
TITLE: SCHEMATIC TOWER CPUZ86
USED ON: TOWER-AT
SIZE A3
50 229
REV 9
DATE: 11-07-88
SHEET: 6 of 12

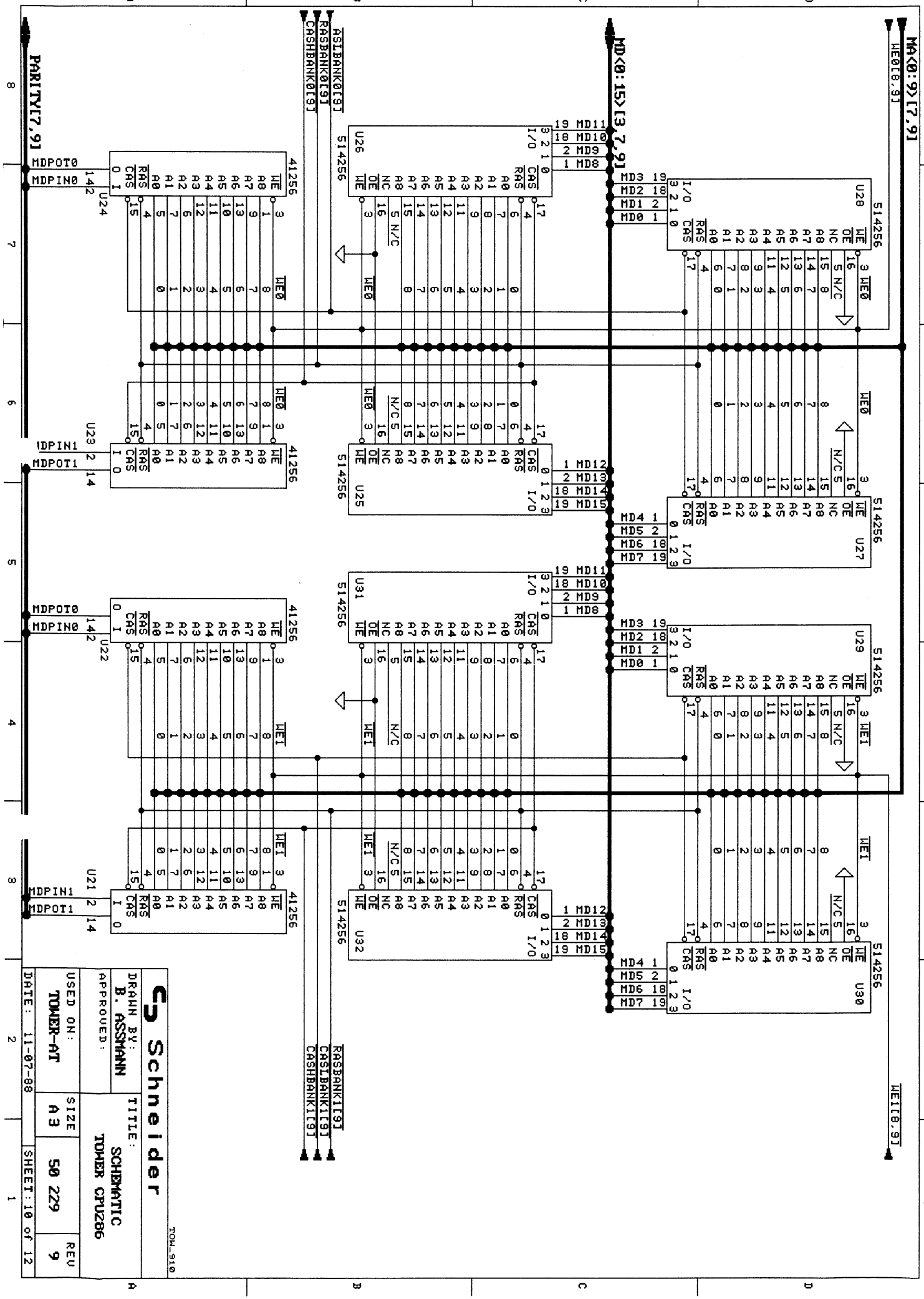

CPUHLDA[2,4,8]
LSBEN[4]
MBDIR[4]
SBHE[8,11]
MDPCKE[4
XMEMR[3,4]
CA20[2]
DT-R[4]
MSBEN[4]
U10
GC102-DAT
Vcc = 22,37,64
Vss = 10,23,35, 47,63
PULLUP
MDPCKE
XMEMR
XBHE
CPUA20
DT/R
MSBEN
MBDIR
LSBEN
CPUHLDA
MDPIN0
MDPIN1
MDPCKN
DAT /ADR
MDPOUT0
MDPOUT1
A20G
CNILOFF
JS9
MDPCK[4]
R21
10K
+5V
SD<0:15>[4,11]
CNILOFF[4]
A20G[5]
PARITY[9,10]
CPU-DATEN<0:15>[2]
MD<0:15>[3,9,10]
LA<17:23>[11]
MASTER[4,11]
MASTER
SAEN[4,11]
REFRESH[4,11]
EALE[11]
MA<0:9>[9,10]
RN3
RN4
68R
R20
SA<0:19>[4,11]
U11
GC102-ADR
Vcc= 22,37,64
GND= 10,23,35, 47,63
ADRSEL
AEN
REFRESH
S0
S1
SBHE
DMAEN
CPUHLDA
BHE
DAT /ADR
ADRSEL[4,8]
DMAAEN[4]
BHE[2,4]
XA<0:16>[2,3,4,5,8]
CPU-ADDR<0:23>
[2,4]
NOTE:
JS9 open: Parity Check off
JS9 closed: Parity Check on
ALS245
U12
DIR
G
TOW_97
Schneider
DRAWN BY: B. ASSMANN
APPROVED:
TITLE: SCHEMATIC TOWER CPU286
USED ON: TOWER-AT
SIZE A3
50 229
REV 9
DATE: 11-07-88
SHEET: 7 of 12

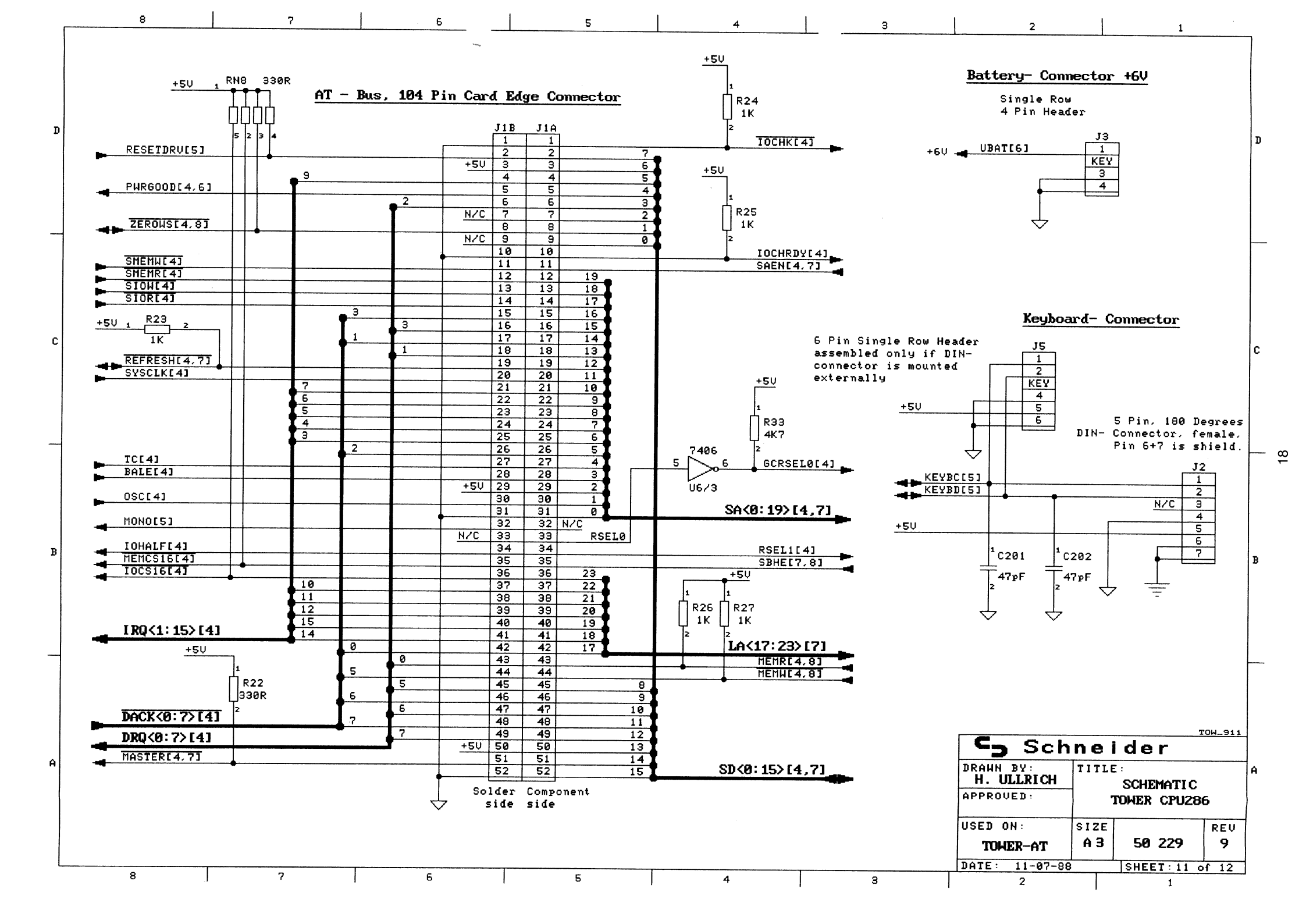


Schneider	DRAWN BY: B. ASSMANN	TITLE: SCHEMATIC TOWER CPU286	
	APPROVED:		
DATE: 11-07-88	USED ON: TOWER-AT	SIZE: A3	REV: 9
		SHEET: 8 of 12	

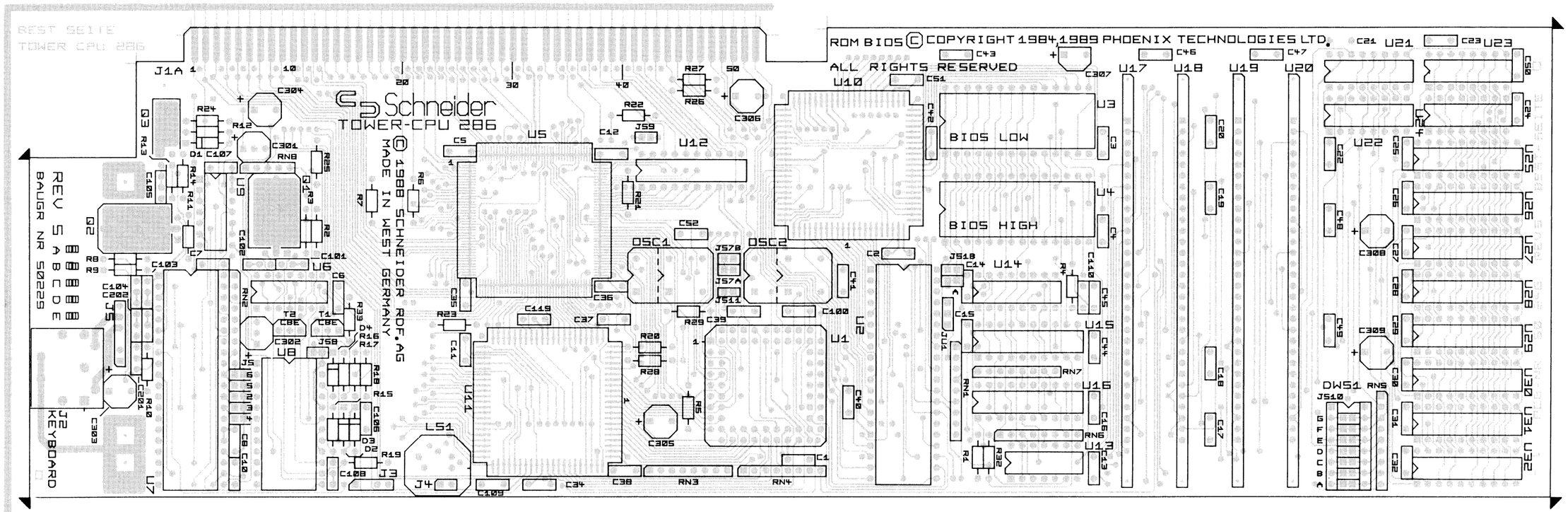
TOW_98


MA<0:9>
[4,7,10]
PARITY
[7,10]
MD<0:15>
[3,7,10]
WE0[8]
WE1[8]
RAS1[8]
CAS1H[8]
CAS1L[8]
RAS0[8]
CAS0L[8]
CAS0H[8]
U17
U18
U19
U20
SIL1MX9
VSS = 9.22
VDD = 1.30
MD0
MD1
MD2
MD3
MD4
MD5
MD6
MD7
MD8
MD9
MD10
MD11
MD12
MD13
MD14
MD15
MDPIN0
MDPOT0
MDPIN1
MDPOT1
CAS0L
CAS0H
CAS1L
CAS1H
RAS0
WE0
WE1
RAS1
N/C
DSW1
JS10A
JS10B
JS10C
JS10D
JS10E
JS10F
JS10G
RN5/2
10K
+5V
RSEL2[4,5]
RASBANK1[10]
CASHBANK1[10]
CASLBANK1[10]
RASBANK0[10]
CASLBANK0[10]
CASHBANK0[10]
NOTE:
JS10B-JS10D / DSW1 7-10, 6-11, 5-12
disconnects DRAM's U21-U22 and U29-U32
JS10E-JS10G / DSW1 4-13, 3-14, 2-15
disconnects DRAM's U23-U24 and U25-U28
J10A / DSW1 8-9 open: DRAM's 1M *1
J10A / DSW1 8-9 closed: DRAM's 256K *4
Schneider
DRAWN BY: B. ASSMANN
APPROVED:
TITLE: SCHEMATIC TOWER CPU286
USED ON: TOWER-AT
SIZE: A3
50 229
REV: 9
DATE: 11-07-88
SHEET: 9 of 12
TOH_99

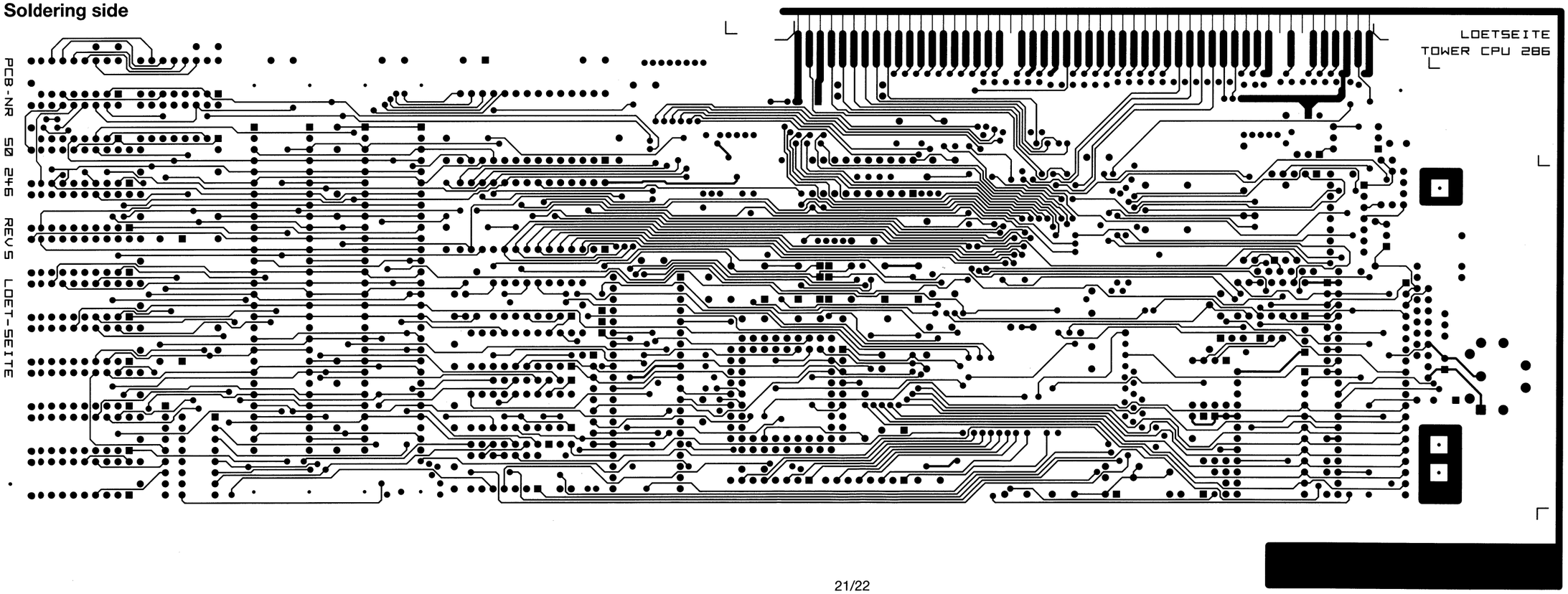

MA<0:9>[7,9]
MD<0:15>[3,7,9]
PARITY[7,9]
WE0[8,9]
WE1[8,9]
ASLBANK0[9]
RASBANK0[9]
CASHBANK0[9]
RASBANK1[9]
CASLBANK1[9]
CASHBANK1[9]
MDPOT0
MDPIN0
MDPIN1
MDPOT1
U21
U22
U23
U24
U25
U26
U27
U28
U29
U30
U31
U32
514256
41256
Schneider
DRAWN BY: B. ASSMANN
APPROVED:
TITLE: SCHEMATIC TOWER CPU286
USED ON: TOWER-AT
SIZE A3
50 229
REV 9
DATE: 11-07-88
SHEET: 10 of 12
TOW_910

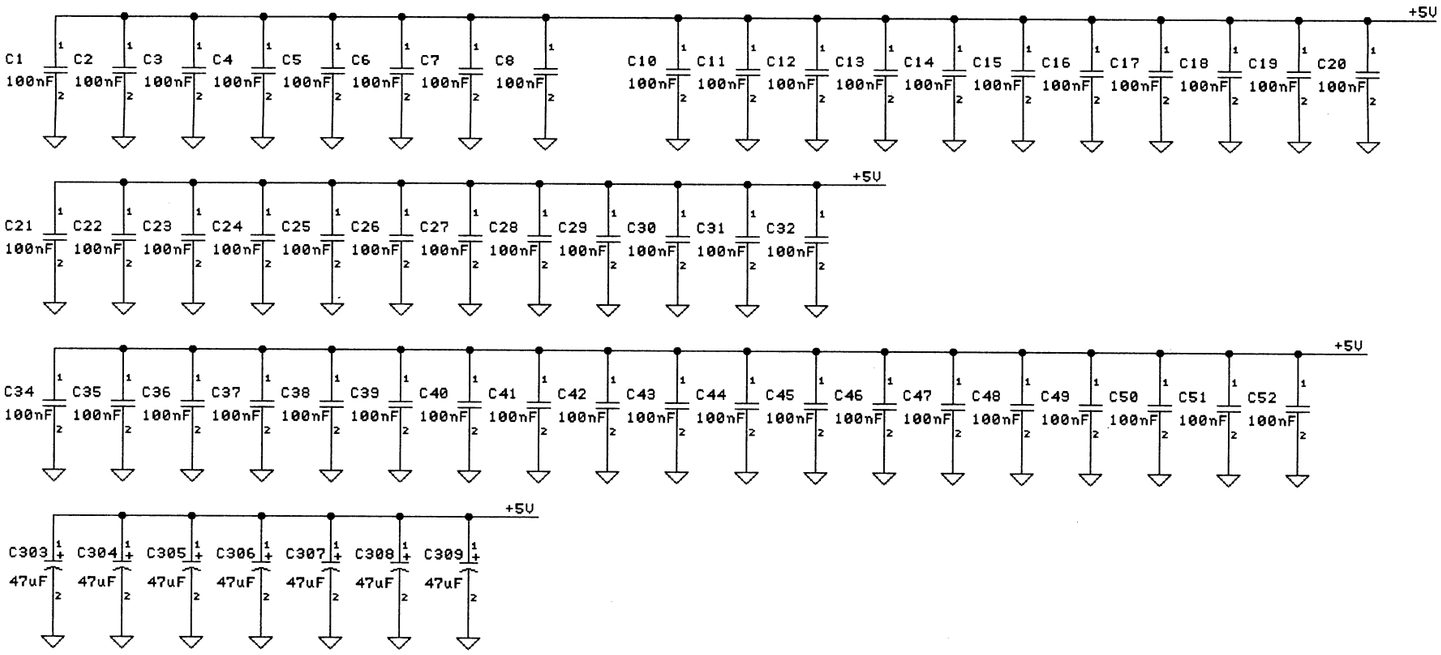

AT - Bus, 104 Pin Card Edge Connector
Battery- Connector +6V
Single Row
4 Pin Header
Keyboard- Connector
6 Pin Single Row Header
assembled only if DIN-
connector is mounted
externally
5 Pin, 180 Degrees
DIN- Connector, female,
Pin 6+7 is shield.
Solder side
Component side
Schneider
DRAWN BY: H. ULLRICH
APPROVED:
TITLE: SCHEMATIC TOWER CPU286
USED ON: TOWER-AT
SIZE A3
50 229
REV 9
DATE: 11-07-88
SHEET: 11 of 12
TOW_911

CPU
Component side



Soldering side





TOW_912

Schneider			
DRAWN BY: B. ASSMANN	TITLE: SCHEMATIC TOWER CPUZ86		
APPROVED:			
USED ON: TOWER-AT	SIZE A3	50 229	REV 9
DATE: 11-07-88		SHEET: 12 of 12	

Ersatzteilliste für Platine Best. (D) VGA AT CPU
Parts List for P.C.B. (D) VGA AT CPU

Best.-Nr. Part.-No.	Bezeichnung	Description	Zeich.-Pos. Ref.-No.	Preisgruppe
50 509 00	IC 80286 CPU 12,5 MHz	IC 80286 CPU 12.5 MHz	U 1	G 4
50 444 00	IC EPROM 256K prog.	IC EPROM 256K prog.	U 3	C 9
50 445 00	IC EPROM 256K prog.	IC EPROM 256K prog.	U 4	C 9
50 047 00	IC GC 101C CPU Contr. (Rev. 4)	IC GC 101C CPU Contr. (Rev. 4)	U 5	F 5
50 776 00	IC GC 101D CPU Contr. (Rev. 5)	IC GC 101D CPU Contr. (Rev. 5)	U 5	F 5
50 122 00	IC 7406	IC 7406	U 6	A 7
50 243 00	IC 8042 prog.	IC 8042 prog.	U 7	C 3
50 177 00	IC DS 1287	IC DS 1287	U 8	D 4
50 323 00	IC MC 14069	IC MC 14069	U 9	A 3
50 046 00	IC GC 102A Address	IC GC 102A Address	U 10, 11	D 7
50 249 00	IC 74 ALS 245	IC 74 ALS 245	U 12	B 1
50 123 00	IC 74 F 00	IC 74 F 00	U 13	A 3
50 242 00	IC 74 F 175	IC 74 F 175	U 14	A 8
50 334 00	IC PAL 16L8BCN RAS-PAL	IC PAL 16L8BCN RAS-PAL	U 15	B 8
50 333 00	IC PAL 16L8BCN CAS-PAL	IC PAL 16L8BCN CAS-PAL	U 16	B 8
50 160 00	IC DRAM 256×4	IC DRAM 256×4	U 25-32	F 4
50 338 00	Diode 1 N 4148	Diode 1 N 4148	D 1,5	A 0
50 325 00	Quarz 14,31818 MHz	Crystal 14.31818 MHz	Q 1	B 3
50 326 00	Quarz 8,0 MHz	Crystal 8.0 MHz	Q 2	B 0
50 327 00	Oszillator 20,0 MHz	Oscillator 20.0 MHz	OSC 1	C 0
50 345 00	Elko rad. 47µF/16V	CE 47µF/16V	C 303-309	A 2
50 344 00	Tantal 10µF/16V	CE 10µF/16V	C 301	A 4
50 381 00	Tantal 1µF/16V	CE 1µF/16V	C 310	A 3
50 316 00	R-Netzwerk 8×10K	Network 8×10K	RN 1, 5	A 3
50 319 00	R-Netzwerk 8×4K7	Network 8×4K7	RN 2	A 3
50 382 00	R-Netzwerk 4×68R	Network 4×68R	RN 3, 4, 6, 7	A 2
50 331 00	R-Netzwerk 4×330R	Network 4×330R	RN 8	A 2
50 332 00	Summer	Buzzer	LS 1	A 8
51 140 00	Buchse Dioden 5pol.	Socket Diode 5-pin	J 2	A 9

CAUTION:

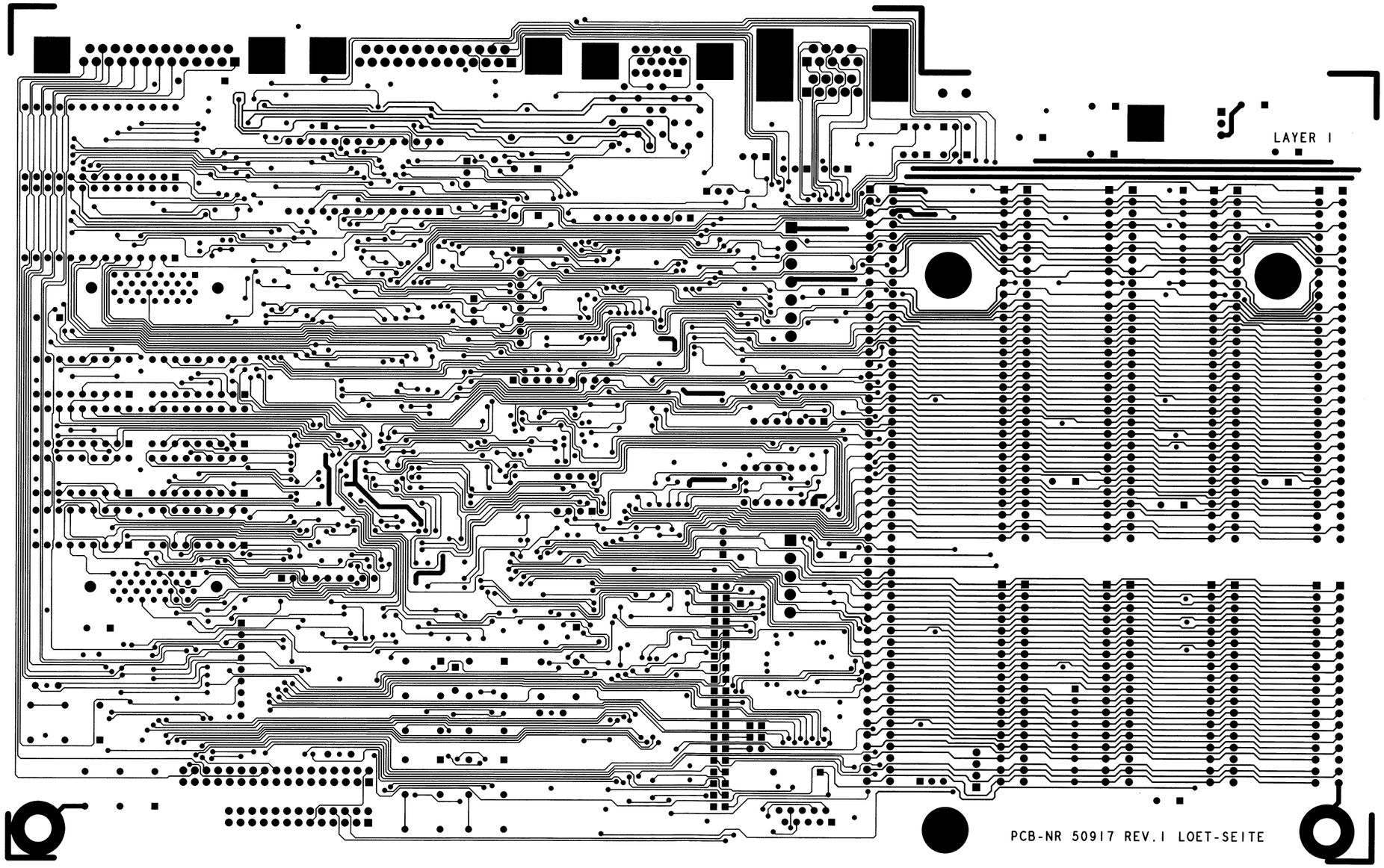
Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions.

Ref.: IEC/74 (Central Office) 104.

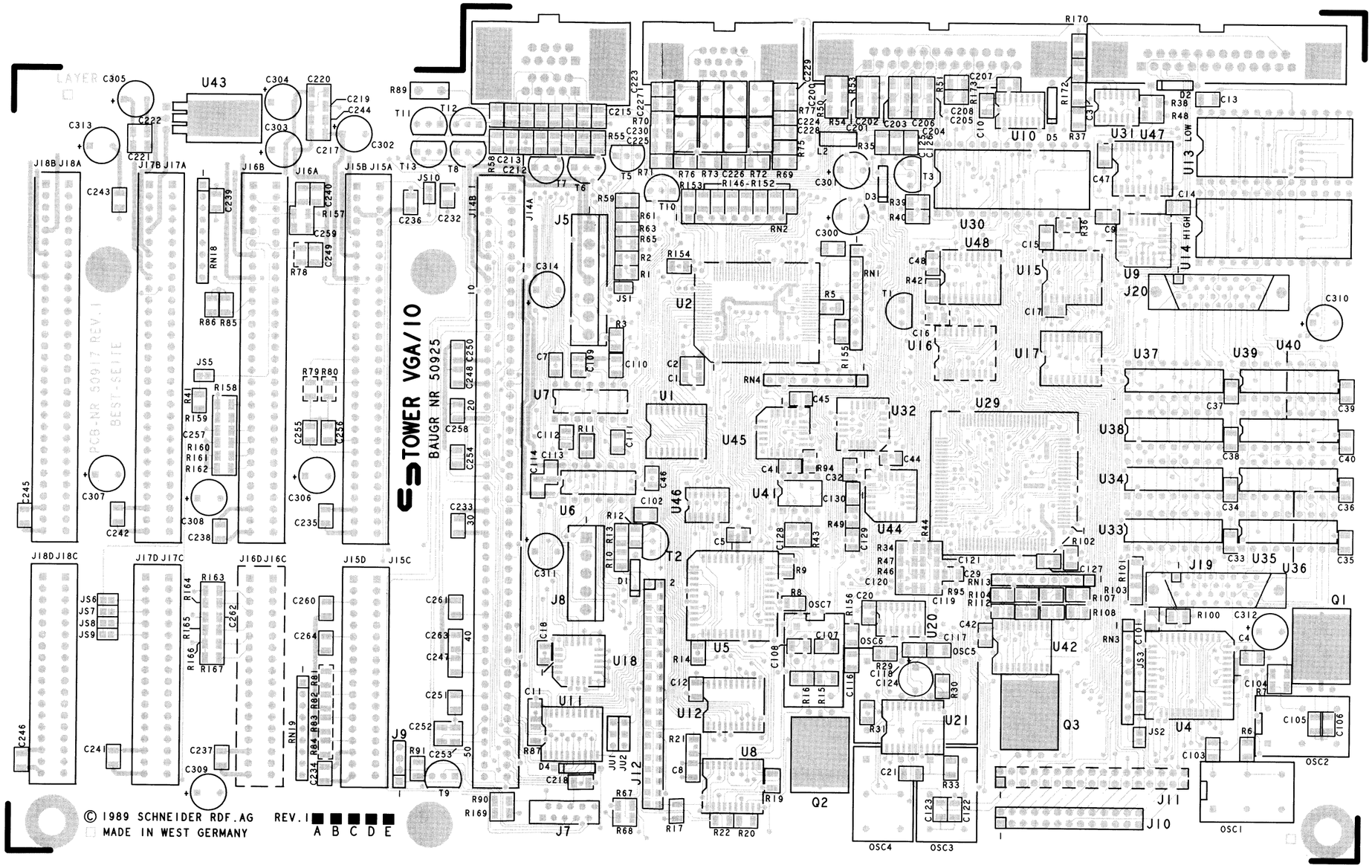
Ersatzteilliste für Platine Best. (D) VGA I/0
Parts List for P.C.B. (D) VGA I/0

Best.-Nr. Part.-No.	Bezeichnung	Description	Zeich.-Pos. Ref.-No.	Preisgruppe
51 319 00	IC 74 LS 245	IC 74 LS 245	U 1	A 7
50 773 00	IC BIG JIM TC110 G008	IC BIG JIM TC 110 G008	U 2	D 1
50 105 00	IC WD 37 C65A-JM00	IC WD 37 C65A-JM00	U 4	D 5
50 827 00	IC 16 C 450 PLCC44	IC 16 C 450 PLCC44	U 5	C 6
50 120 00	IC MC 1488	IC MC 1488	U 6	A 5
50 121 00	IC MC 1489	IC MC 1489	U 7	A 5
51 321 00	IC 74 LS 244	IC 74 LS 244	U 8	B 0
51 546 00	IC PAL 16 L8A	IC PAL 16 L8A	U 9	C 2
51 318 00	IC 74 HC 165	IC 74 HC 165	U 10	A 9
51 319 00	IC 74 LS 245	IC 74 LS 245	U 11, 12	A 7
51 368 00	IC 27C256-15 BIOS »LOW«	IC 27C256-15 BIOS »LOW«	U 13	D 9
51 369 00	IC 27C256-15 BIOS »HIGH«	IC 27C256-15 BIOS »HIGH«	U 14	D 9
51 321 00	IC 74 LS 244	IC 74 LS 244	U 15	B 0
51 319 00	IC 74 LS 245	IC 74 LS 245	U 17	A 7
51 542 00	IC 74 F 151	IC 74 F 151	U 20	A 8
51 377 00	IC ATI 18899-2	IC ATI 18899-2	U 29	F 2
50 955 00	IC G176P-50	IC G176P-50	U 30	D 2
51 543 00	IC LM 339	IC LM 339	U 31	B 2
51 378 00	IC PAL 16 L8A	IC PAL 16 L8A	U 32	C 2
50 118 00	IC DRAM 64K×4	IC DRAM 64K×4	U 33–40	C 7
51 326 00	IC NMC 930 6N	IC NMC 930 6N	U 41	B 2
50 933 00	IC 74 F 241	IC 74 F 241	U 42	A 8
50 238 00	IC 7905 T0220	IC 7905 T0220	U 43	A 6
51 423 00	IC PAL 16 L8B	IC PAL 16 L8B	U 44	C 2
51 422 00	IC PAL 16 L8A	IC PAL 16 L8A	U 45	C 2
51 545 00	IC 74 F 32	IC 74 F 32	U 46	A 5
51 321 00	IC 74 LS 244	IC 74 LS 244	U 47	B 0
51 319 00	IC 74 LS 245	IC 74 LS 245	U 48	A 7
50 338 00	Diode 1 N 4148	Diode 1 N 4148	D 1–5	A 0
52 167 00	Diode SB 120	Diode SB 120	D 6	A 3
50 358 00	Transistor BC 337 B	Transistor BC 337 B	T 1–3, 5–8	A 2
51 042 00	Transistor BC 327 B	Transistor BC 327 B	T 9–13	A 2
51 093 00	Quarz 9,6 MHz	Crystal 9.6 MHz	Q 1	A 8
50 313 00	Oszillator 16,0 MHz	Oscillator 16,0 MHz	OSC 1	C 0
50 990 00	Oszillator 50,0 MHz	Oscillator 50.0 MHz	OSC 3	B 9
50 989 00	Oszillator 45,0 MHz	Oscillator 45.0 MHz	OSC 4	B 9
50 988 00	Oszillator 36,0 MHz	Oscillator 36.0 MHz	OSC 5	B 9
50 991 00	Oszillator 56,644 MHz	Oscillator 56.644 MHz	OSC 6	B 9
51 330 00	Oszillator 1,8432 MHz	Oscillator 1.8432 MHz	OSC 7	C 2
51 332 00	Spule-HF 4,7 uH	Coil, HF 4.7 uH	L 2	A 5
50 321 00	Widerstand PTC OR 75	Resistor PTC OR 75	R 89	B 0
50 316 00	R-Netzwerk 8×10K	R-Network 8×10K	RN 1	A 3
50 317 00	R-Netzwerk 8×1K0	R-Network 8×1K0	RN 2, 3	A 3
50 319 00	R-Netzwerk 8×4K7	R-Network 8×4K7	RN 4, 13, 18, 19	A 3
50 133 00	Buchse SUB-D 25pol.	Socket SUB-D 25-pin	J 1, 6	B 2
50 949 00	Buchse SUB-D 9pol.	Socket SUB-D 9-pin	(J 2 + 4)	C 3
50 254 00	Stiftleiste RM 3,96 7pol.	Connector RM 3.96 7-pin	J 5	A 5
51 375 00	Stiftleiste RM 1,27 10pol.	Connector RM 1.27 10-pin	J 7	A 3
50 322 00	Stiftleiste RM 3,96 5pol.	Connector RM 3.96 5-pin	J 8	A 3
51 376 00	Stiftleiste RM 2,54 1×5pol.	Connector 2.54 1×4-pin	J 9	A 1
51 569 00	Stiftleiste RM 2,54 26pol.	Connector 2.54 26-pin	J 10	A 7
51 085 00	Stiftleiste 2×20	Connector 2×20	J 12	A 7

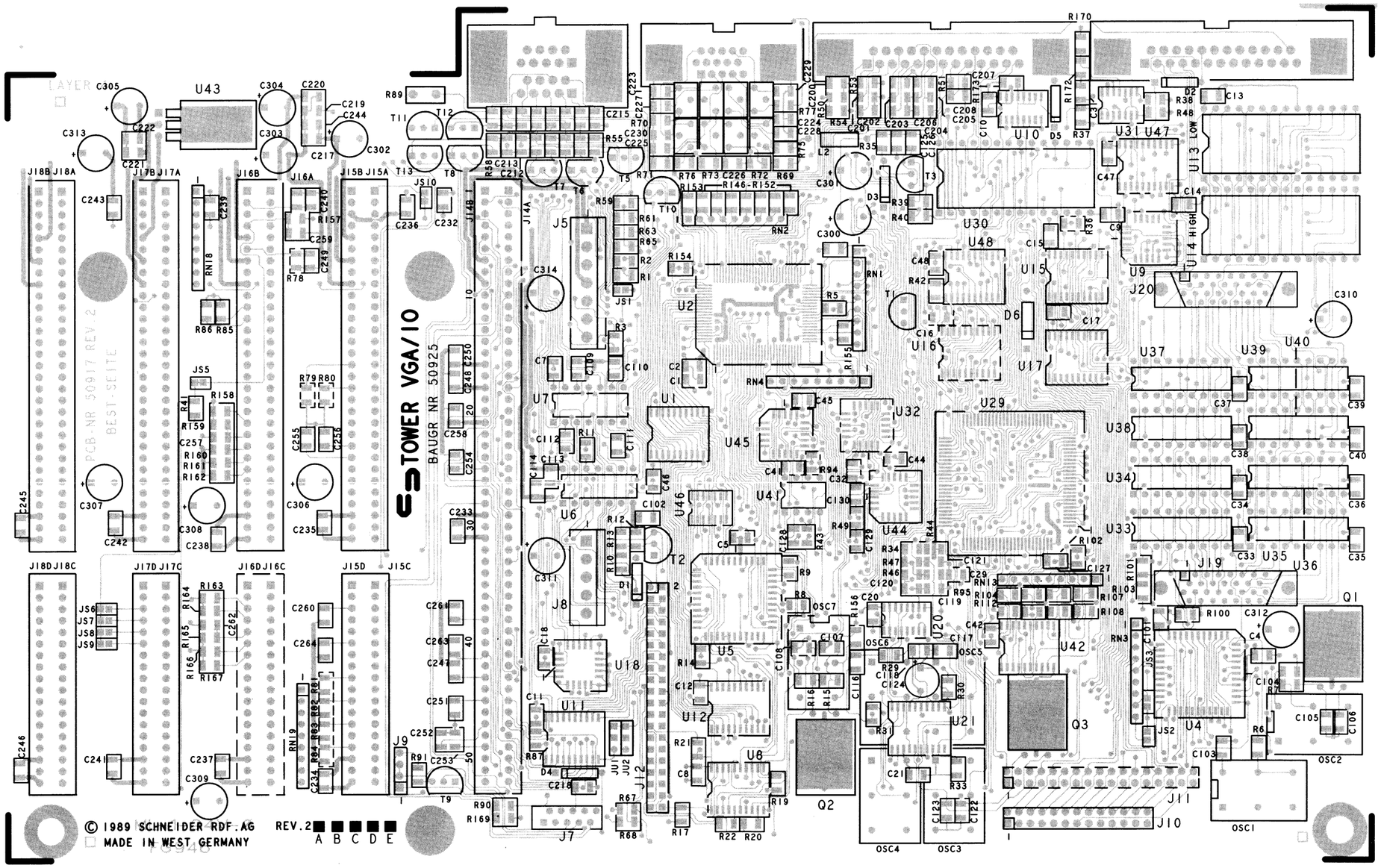
VGA I/0
Soldering side



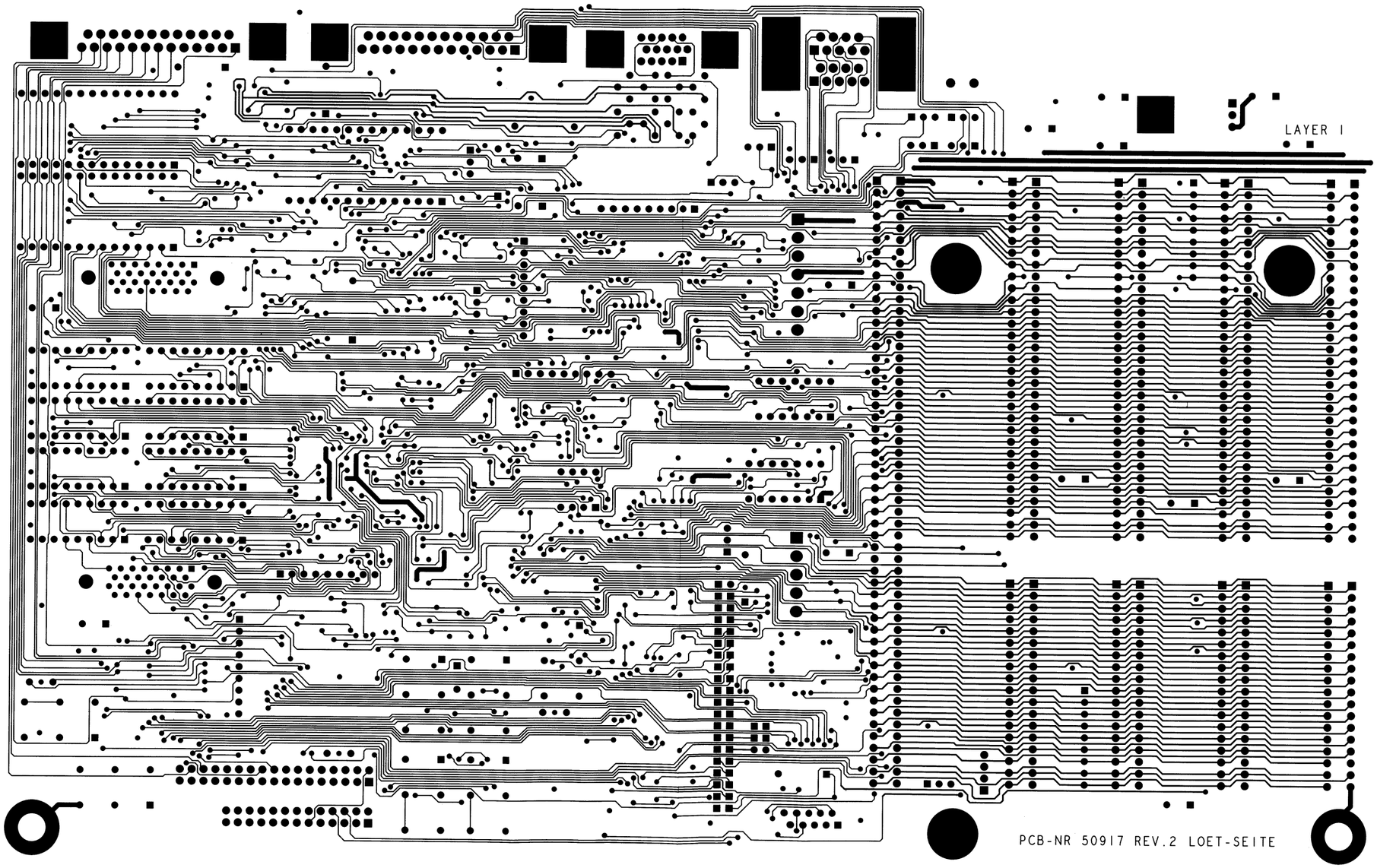
VGA I/0
Component side

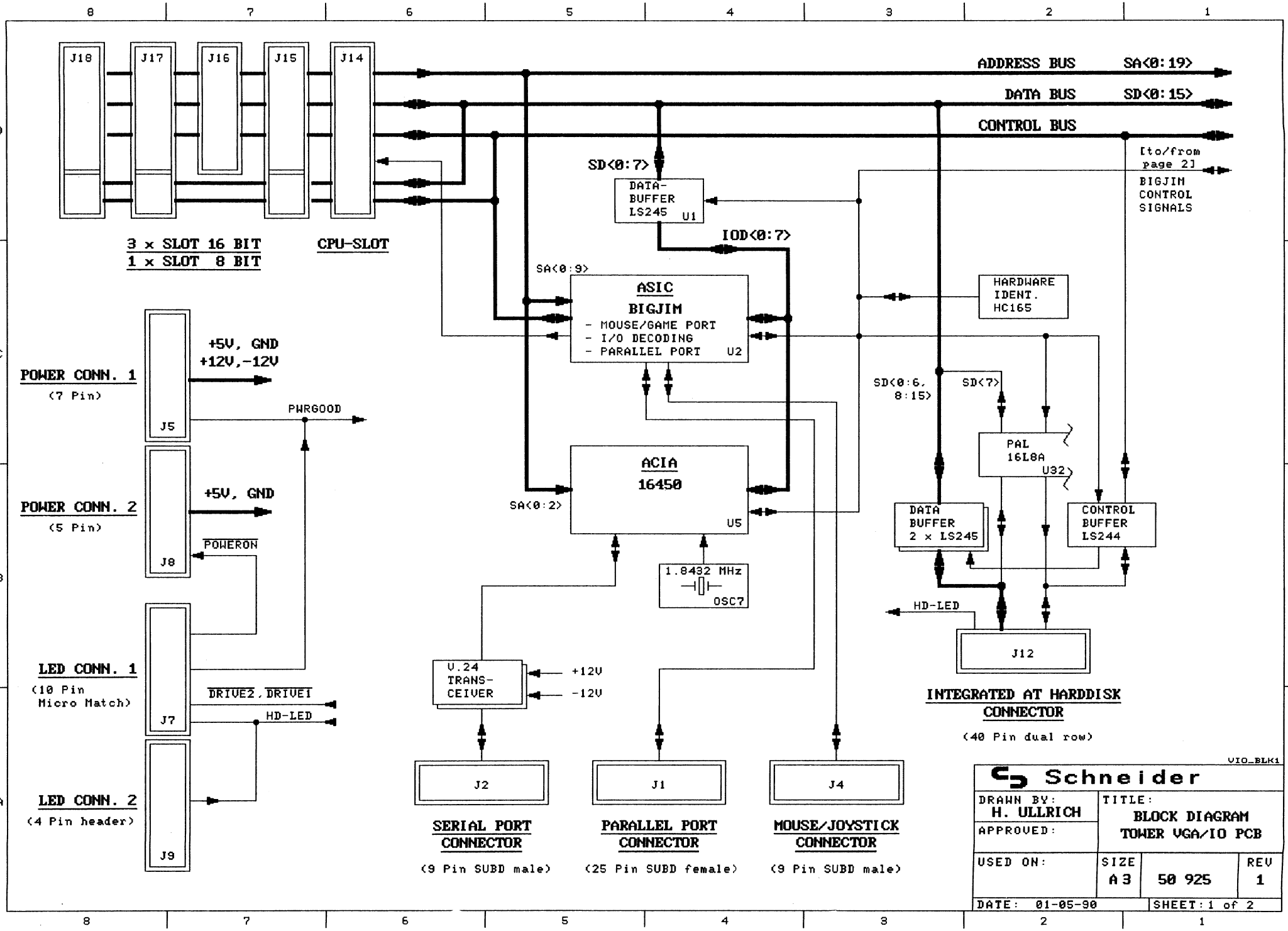


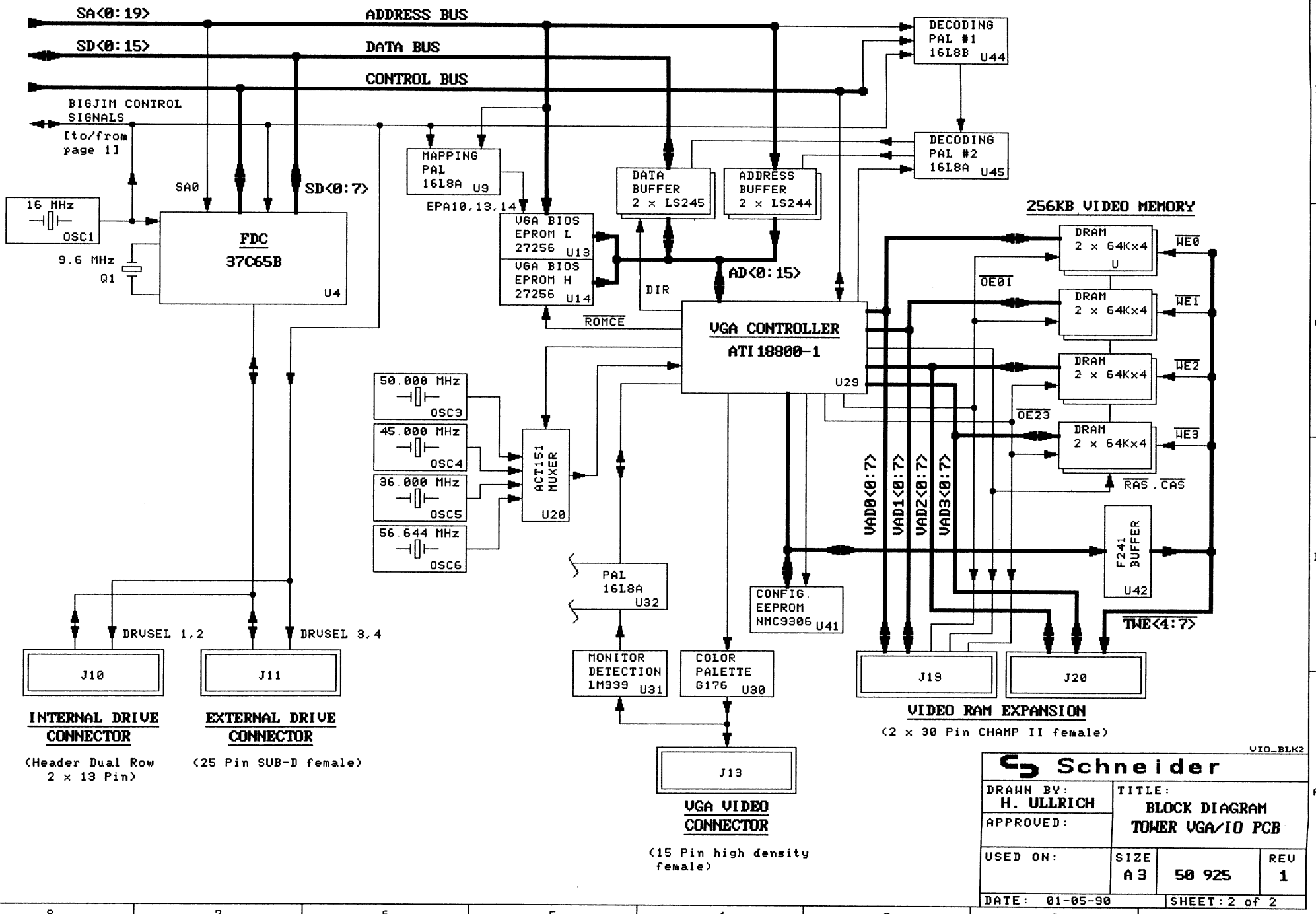
VGA I/0
Component side



VGA I/0
Soldering side




J18
J17
J16
J15
J14
3 x SLOT 16 BIT
1 x SLOT 8 BIT
CPU-SLOT
ADDRESS BUS SA<0:19>
DATA BUS SD<0:15>
CONTROL BUS
[to/from page 2]
BIGJIM CONTROL SIGNALS
SD<0:7>
DATA-BUFFER LS245 U1
IOD<0:7>
SA<0:9>
ASIC
BIGJIM
- MOUSE/GAME PORT
- I/O DECODING
- PARALLEL PORT U2
HARDWARE IDENT. HC165
POWER CONN. 1
(7 Pin)
J5
+5V, GND
+12V,-12V
PWRGOOD
POWER CONN. 2
(5 Pin)
J8
+5V, GND
POWERON
ACIA
16450
U5
SA<0:2>
SD<0:6, 8:15>
SD<7>
PAL 16L8A U32
DATA BUFFER 2 x LS245
CONTROL BUFFER LS244
1.8432 MHz
OSC7
HD-LED
J12
INTEGRATED AT HARDDISK CONNECTOR
(40 Pin dual row)
LED CONN. 1
(10 Pin Micro Match)
J7
DRIVE2, DRIVE1
HD-LED
U.24 TRANS-CEIVER
+12V
-12V
LED CONN. 2
(4 Pin header)
J9
J2
J1
J4
SERIAL PORT CONNECTOR
(9 Pin SUBD male)
PARALLEL PORT CONNECTOR
(25 Pin SUBD female)
MOUSE/JOYSTICK CONNECTOR
(9 Pin SUBD male)
VIO_BLK1
Schneider
DRAWN BY: H. ULLRICH
APPROVED:
TITLE: BLOCK DIAGRAM TOWER VGA/IO PCB
USED ON:
SIZE A3
50 925
REV 1
DATE: 01-05-90
SHEET: 1 of 2



VIO_BLK2

Schneider

DRAWN BY: H. ULLRICH	TITLE: BLOCK DIAGRAM TOWER VGA/IO PCB		
APPROVED:			
USED ON:	SIZE A3	50 925	REV 1
DATE: 01-05-90	SHEET: 2 of 2		

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
1	ADVANCED ENGINEERING RELEASE	07-17-89	
2	NEW RAM MODUL CONNECTORS, DIODE D6 ADDED (PCB REV.2 AND REV.1A)	01-08-90	K. WINZEK

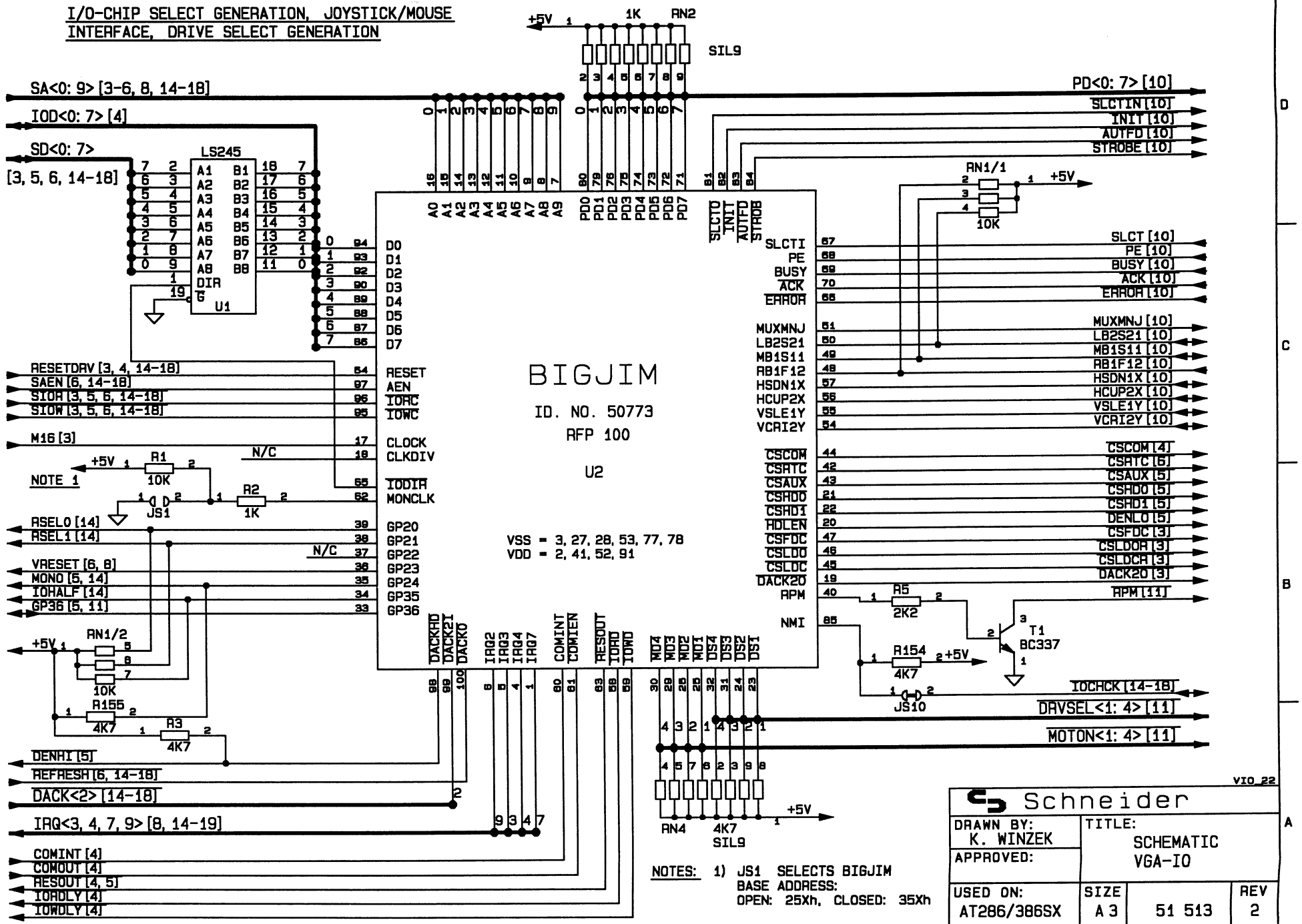
DRAWING FILES:	CONTENTS:
VIO_21.DWG	THIS SHEET
VIO_22.DWG	ASIC BIGJIM
VIO_23.DWG	FLOPPY INTERFACE
VIO_24.DWG	SERIAL INTERFACE
VIO_25.DWG	INTEGRATED DRIVE INTERFACE
VIO_26.DWG	VIDEO I (BUS INTERFACE & ROM)
VIO_27.DWG	VIDEO II (CLOCK GENERATION)
VIO_28.DWG	VIDEO III (CONTROLLER)
VIO_29.DWG	VIDEO RAM
VIO_210.DWG	CONNECTORS I
VIO_211.DWG	CONNECTORS II
VIO_212.DWG	CONNECTORS III
VIO_213.DWG	CONNECTORS IV
VIO_214.DWG	CPU SLOT
VIO_215.DWG	NORMAL SLOT
VIO_216.DWG	NORMAL SLOT
VIO_217.DWG	NORMAL SLOT
VIO_218.DWG	NORMAL SLOT
VIO_219.DWG	BLOCK CAPS, SPARE GATES

VIO_21

Schneider

DRAWN BY: K. WINZEK	TITLE: SCHEMATIC TOWER-VGA/IO		
APPROVED:			
USED ON: AT286/386SX	SIZE A 3	50 925	REV 2
DATE: 01-08-90	SHEET: 1 of 19		

I/O-CHIP SELECT GENERATION, JOYSTICK/MOUSE INTERFACE, DRIVE SELECT GENERATION

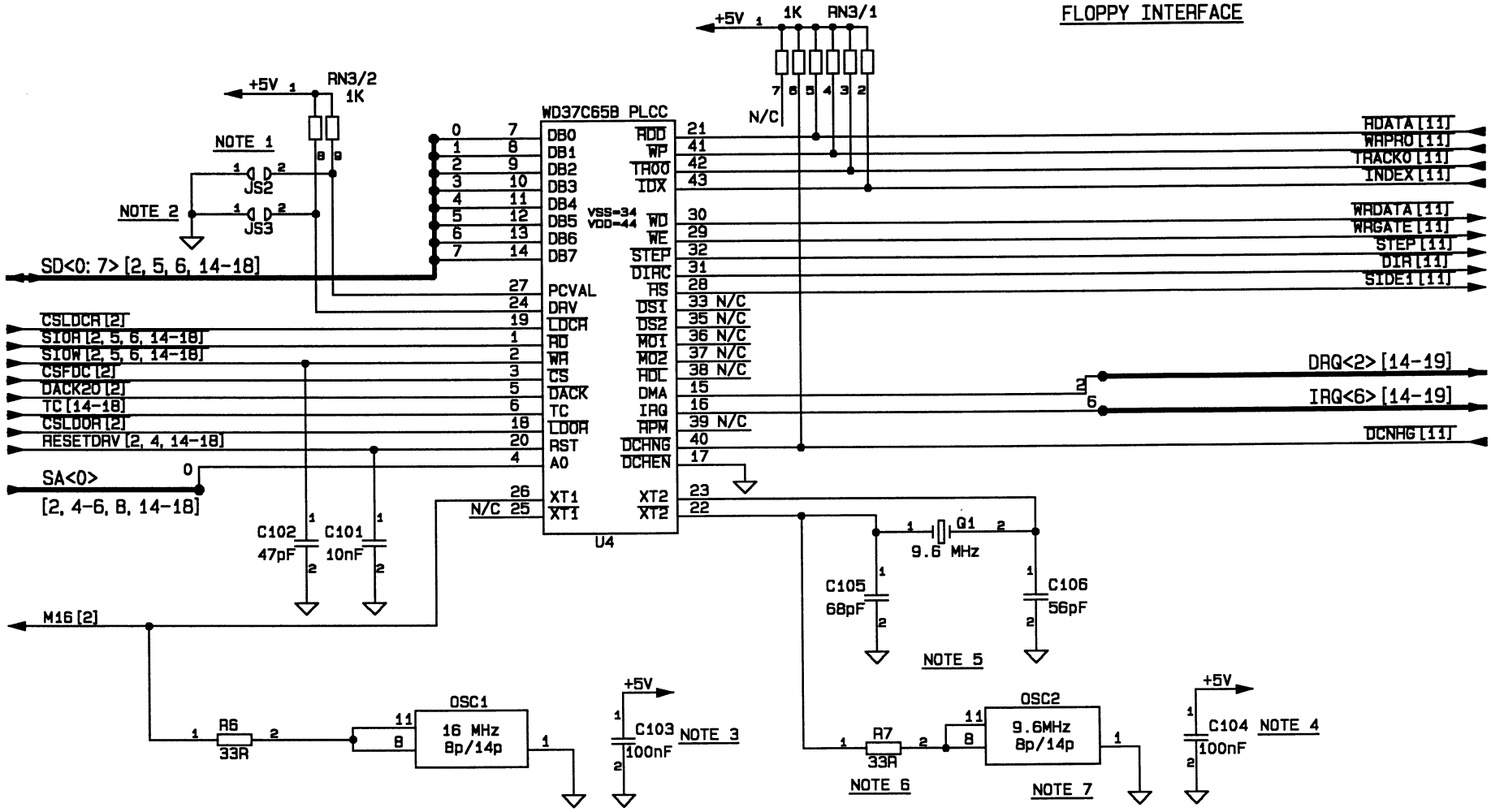


VIO_22

Schneider

DRAWN BY: K. WINZEK	TITLE: SCHEMATIC VGA-IO		
APPROVED:			
USED ON: AT286/386SX	SIZE A 3	51 513	REV 2
DATE: 01-05-90	SHEET: 2 of 19		

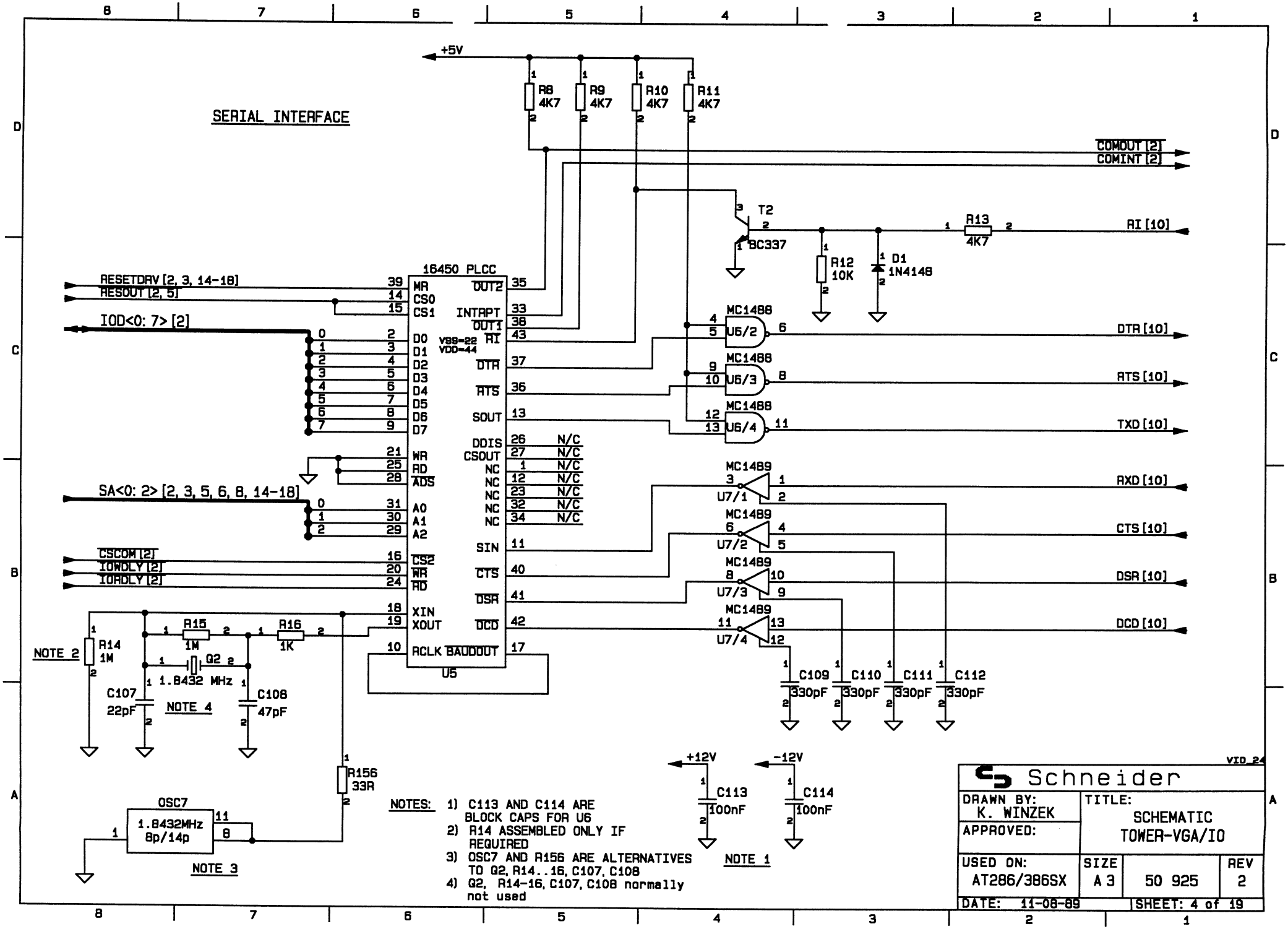
FLOPPY INTERFACE

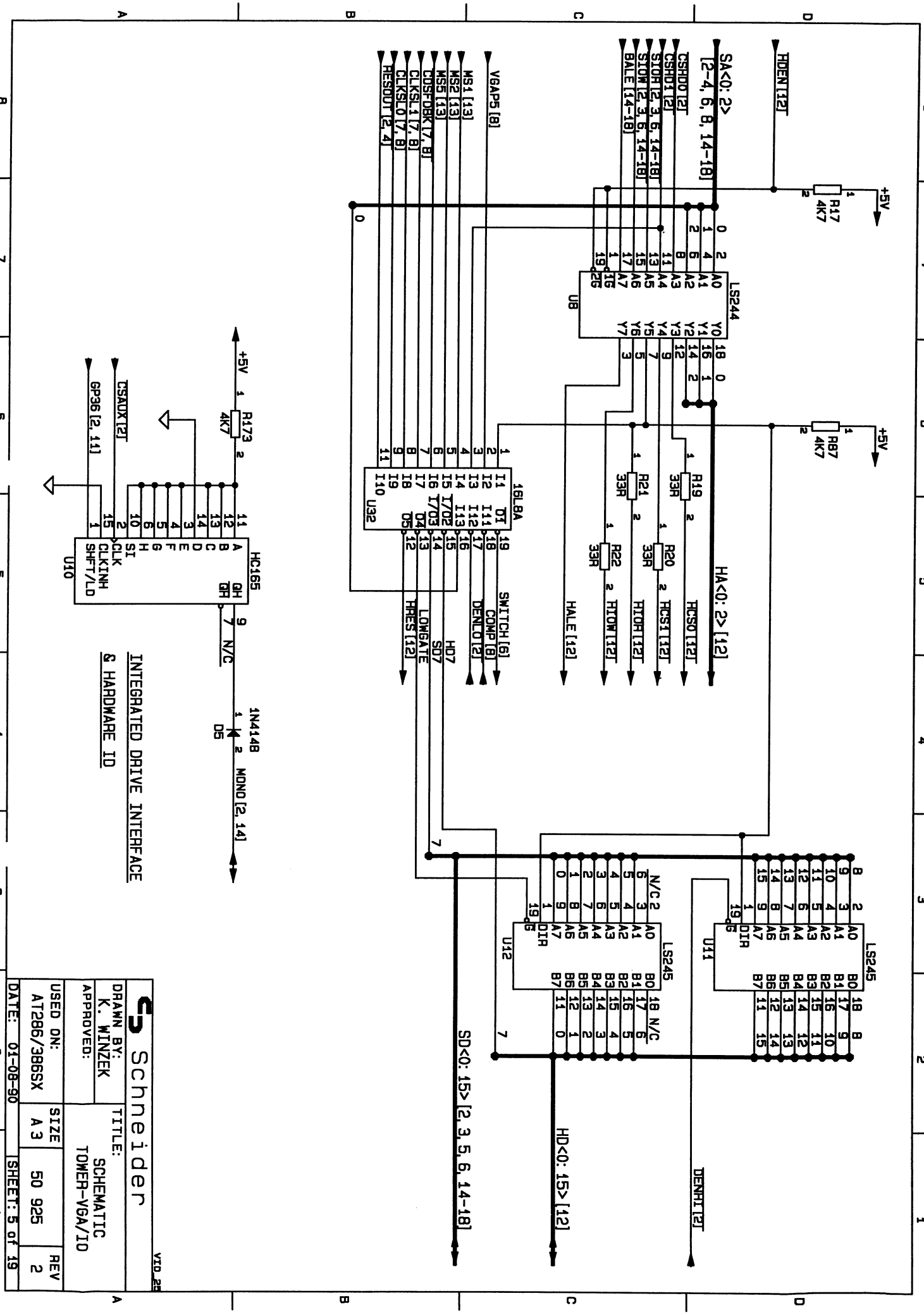


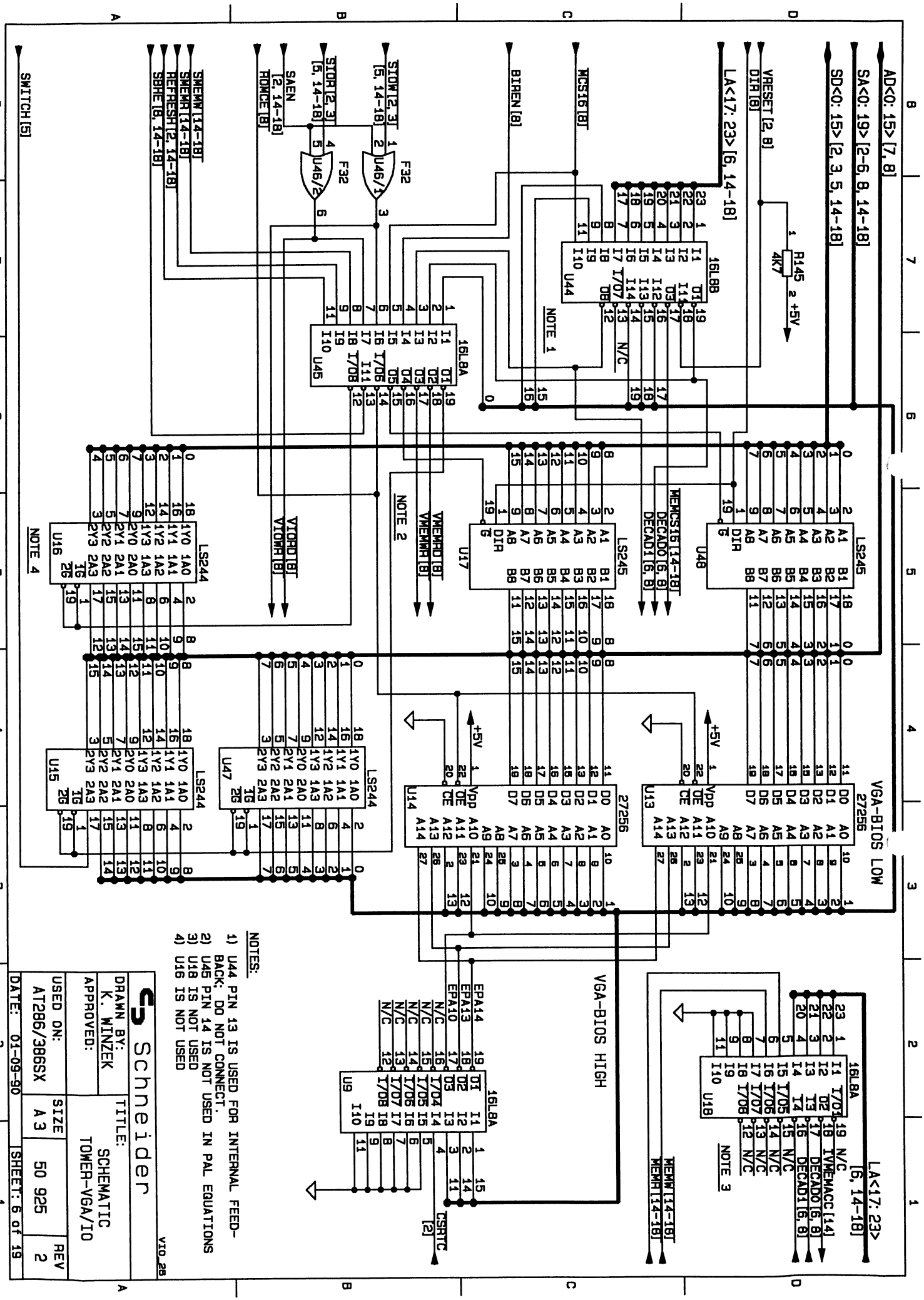
NOTES:
1) JS2 SELECTS WRITE PRECOMP. VAL.:
   JS2 OPEN : 125 ns
   JS2 CLOSED: 187 ns
2) JS3 SELECTS 2 SPEED SPINDLE DRIVE IF CLOSED
3) C103 IS BLOCK CAP FOR OSC1
4) C104 IS BLOCK CAP FOR OSC2
5) EITHER OSC2, R7 OR Q1, C105, C106 ARE INSERTED
6) R7 MAY BE 0 OHM (BRIDGE)
7) OSC2, R7 normally not used

VID_23

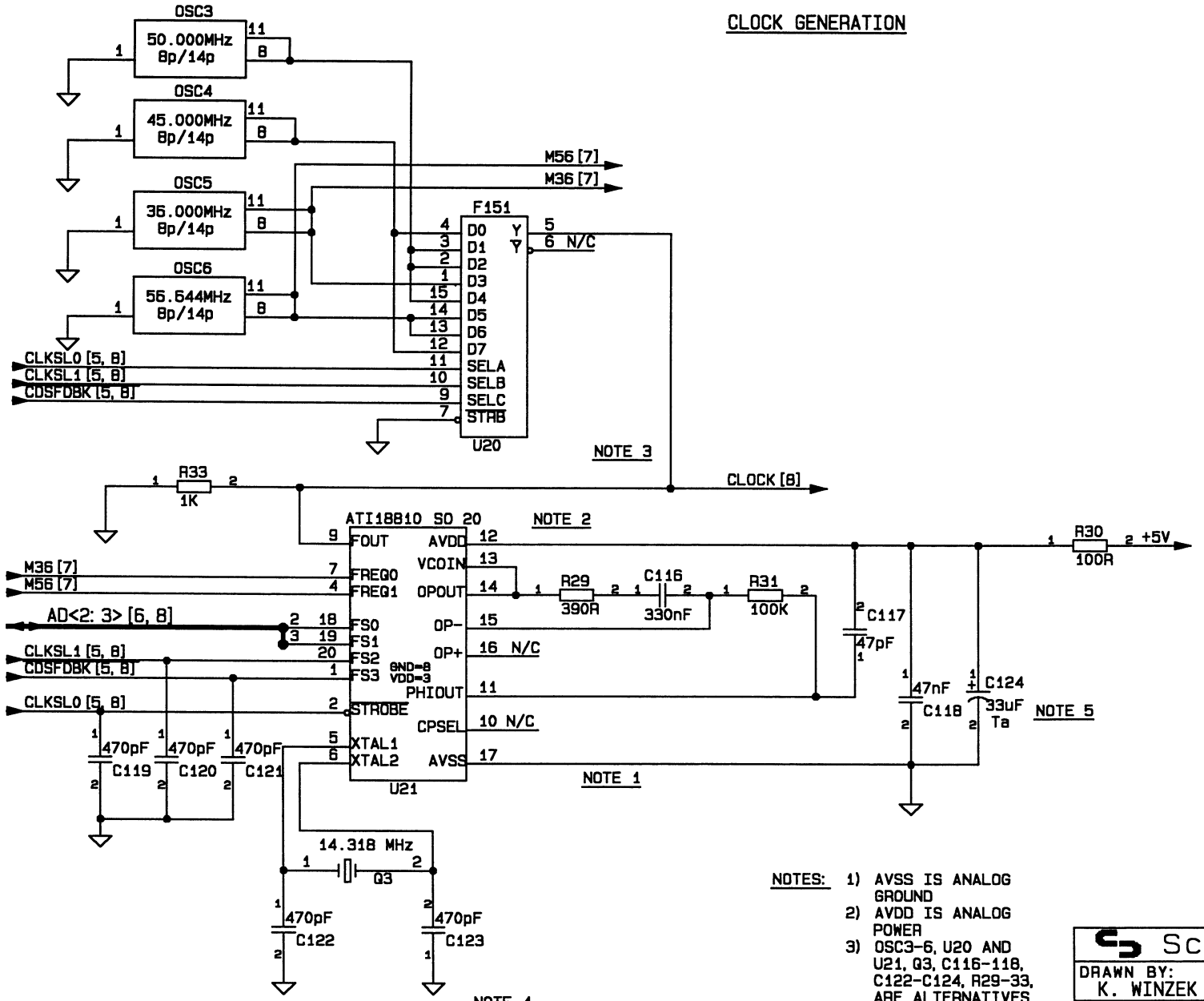
Schneider			
DRAWN BY: K. WINZEK	TITLE: SCHEMATIC TOWER-VGA/IO		
APPROVED:			
USED ON: AT286/386SX	SIZE A 3	50 925	REV 2
DATE: 01-05-90	SHEET: 3 of 19		


SERIAL INTERFACE
+5V
R8 4K7
R9 4K7
R10 4K7
R11 4K7
COMOUT [2]
COMINT [2]
T2
BC337
R13 4K7
RI [10]
R12 10K
D1 1N4148
16450 PLCC
RESETDRV [2, 3, 14-18]
RESOUT [2, 5]
IOD<0: 7> [2]
SA<0: 2> [2, 3, 5, 6, 8, 14-18]
CSCOM [2]
IOWDLY [2]
IORDLY [2]
MR
CS0
CS1
D0
D1
D2
D3
D4
D5
D6
D7
WR
RD
ADS
A0
A1
A2
CS2
WR
RD
XIN
XOUT
RCLK
OUT2
INTRPT
OUT1
RI
DTR
RTS
SOUT
DDIS
CSOUT
NC
SIN
CTS
DSR
DCD
BAUDOUT
V88=22
VDD=44
N/C
U5
MC1488
U6/2
U6/3
U6/4
DTR [10]
RTS [10]
TXD [10]
MC1489
U7/1
U7/2
U7/3
U7/4
RXD [10]
CTS [10]
DSR [10]
DCD [10]
C109 330pF
C110 330pF
C111 330pF
C112 330pF
R14 1M
NOTE 2
R15 1M
R16 1K
Q2
1.8432 MHz
C107 22pF
NOTE 4
C108 47pF
R156 33R
OSC7
1.8432MHz 8p/14p
NOTE 3
+12V
-12V
C113 100nF
C114 100nF
NOTE 1
NOTES:
1) C113 AND C114 ARE BLOCK CAPS FOR U6
2) R14 ASSEMBLED ONLY IF REQUIRED
3) OSC7 AND R156 ARE ALTERNATIVES TO Q2, R14..16, C107, C108
4) Q2, R14-16, C107, C108 normally not used
Schneider
VID_24
DRAWN BY: K. WINZEK
APPROVED:
TITLE: SCHEMATIC TOWER-VGA/IO
USED ON: AT286/386SX
SIZE A 3
50 925
REV 2
DATE: 11-08-89
SHEET: 4 of 19


INTEGRATED DRIVE INTERFACE
& HARDWARE ID
Schneider
DRAWN BY: K. WINZEK
APPROVED:
TITLE: SCHEMATIC TOWER-VGA/IO
USED ON: AT286/386SX
SIZE A 3
50 925
REV 2
DATE: 01-08-90
SHEET: 5 of 19
HDEN [12]
SA<0: 2> [2-4, 6, 8, 14-18]
CSHDD [2]
CSHD1 [2]
SIOR [2, 3, 6, 14-18]
SIOW [2, 3, 6, 14-18]
BALE [14-18]
RESDRV [2, 4]
VGAPS [8]
MS1 [13]
MS2 [13]
MS5 [13]
COSFDBK [7, 8]
CLKSL1 [7, 8]
CLKSL0 [7, 8]
GP36 [2, 11]
CSAUX [2]
MONO [2, 14]
HA<0: 2> [12]
HALE [12]
HCS0 [12]
HCS1 [12]
HIOR [12]
HIOW [12]
SWITCH [6]
COMP [8]
DENLO [2]
HRES [12]
LOWGATE
HD7
SD7
SD<0: 15> [2, 3, 5, 6, 14-18]
HD<0: 15> [12]
DENRD [12]
U8
LS244
U32
16L8A
U10
HC165
U11
LS245
U12
LS245
R17 4K7
R87 4K7
R173 4K7
R19 33R
R21 33R
R20 33R
R22 33R
D5
1N414B
+5V
N/C


AD<0: 15> [7, 8]
SA<0: 19> [2-6, 8, 14-18]
SD<0: 15> [2, 3, 5, 14-18]
LA<17: 23> [6, 14-18]
VRESET [2, 8]
DIR [8]
R145 4K7
+5V
MCS16 [8]
BIREN [8]
SIOW [2, 3] [5, 14-18]
SIOR [2, 3] [5, 14-18]
SAEN [2, 14-18]
ROMCE [8]
SMEMW [14-18]
SMEMR [14-18]
REFRESH [2, 14-18]
SBHE [8, 14-18]
SWITCH [5]
F32
U46/1
U46/2
U44
16L8B
NOTE 1
U45
16L8A
U48
LS245
MEMCS16 [14-18]
DECAD0 [6, 8]
DECAD1 [6, 8]
U17
VMEMRD [8]
VMEMWR [8]
VIORD [8]
VIOWR [8]
NOTE 2
U16
LS244
NOTE 4
U15
U47
U14
27256
VGA-BIOS LOW
U13
VGA-BIOS HIGH
U18
IVMEMACC [14]
NOTE 3
MEMW [14-18]
MEMR [14-18]
U9
EPA14
EPA13
EPA10
CSRTC [2]
NOTES:
1) U44 PIN 13 IS USED FOR INTERNAL FEED-BACK; DO NOT CONNECT.
2) U45 PIN 14 IS NOT USED IN PAL EQUATIONS
3) U18 IS NOT USED
4) U16 IS NOT USED
Schneider
VIO_2B
DRAWN BY: K. WINZEK
APPROVED:
TITLE: SCHEMATIC TOWER-VGA/IO
USED ON: AT286/386SX
SIZE: A 3
50 925
REV: 2
DATE: 01-09-90
SHEET: 6 of 19

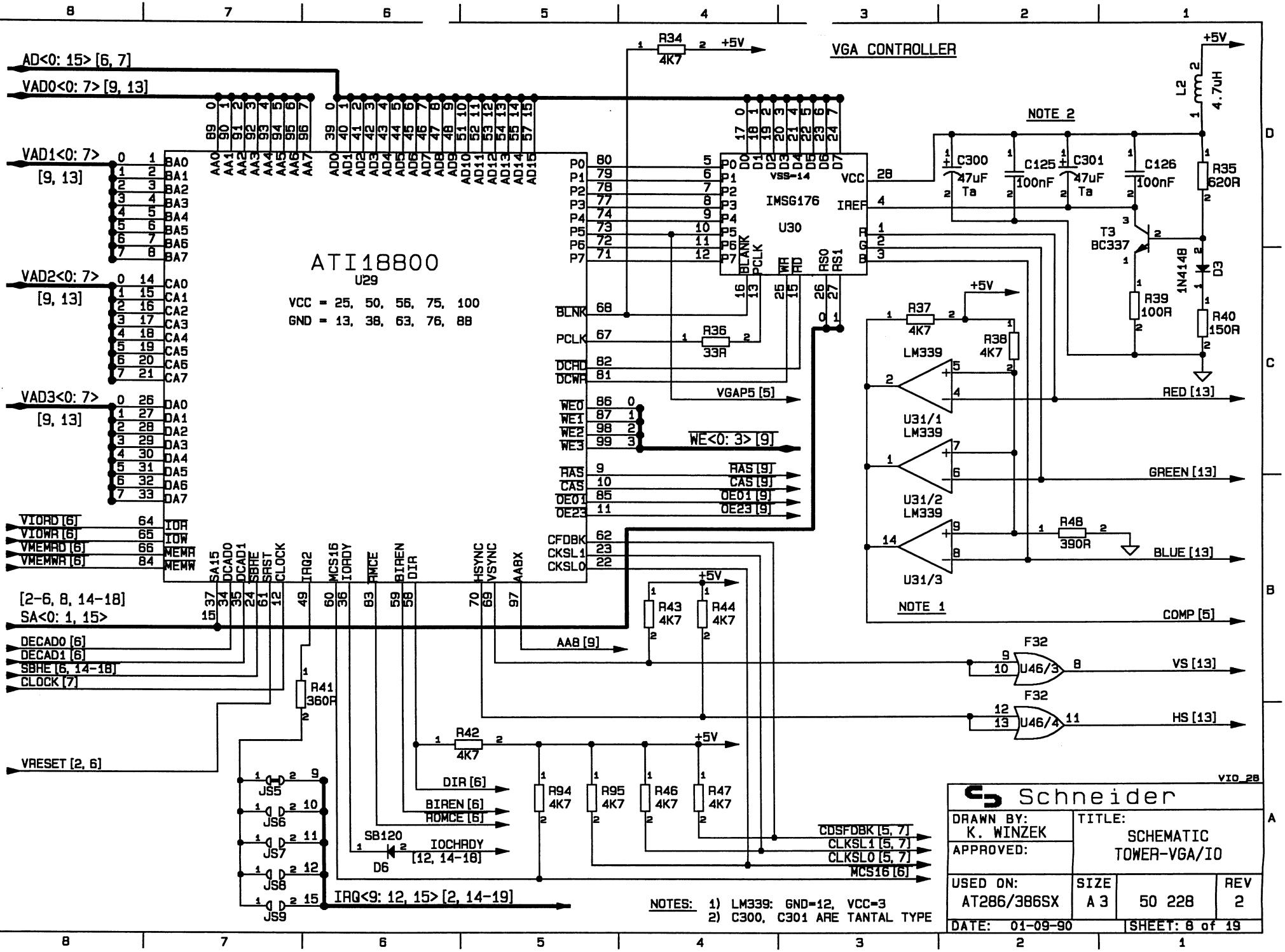
CLOCK GENERATION

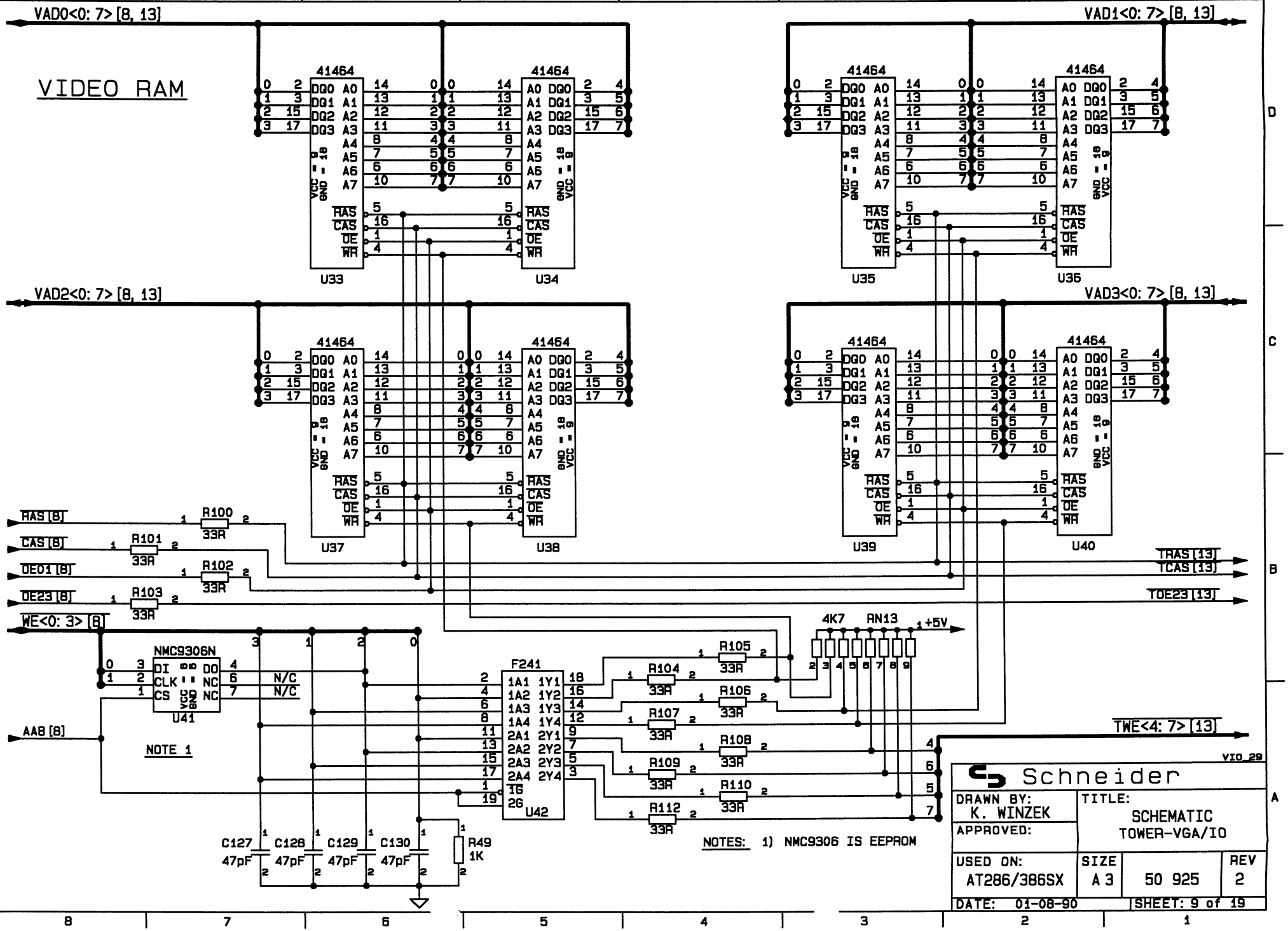


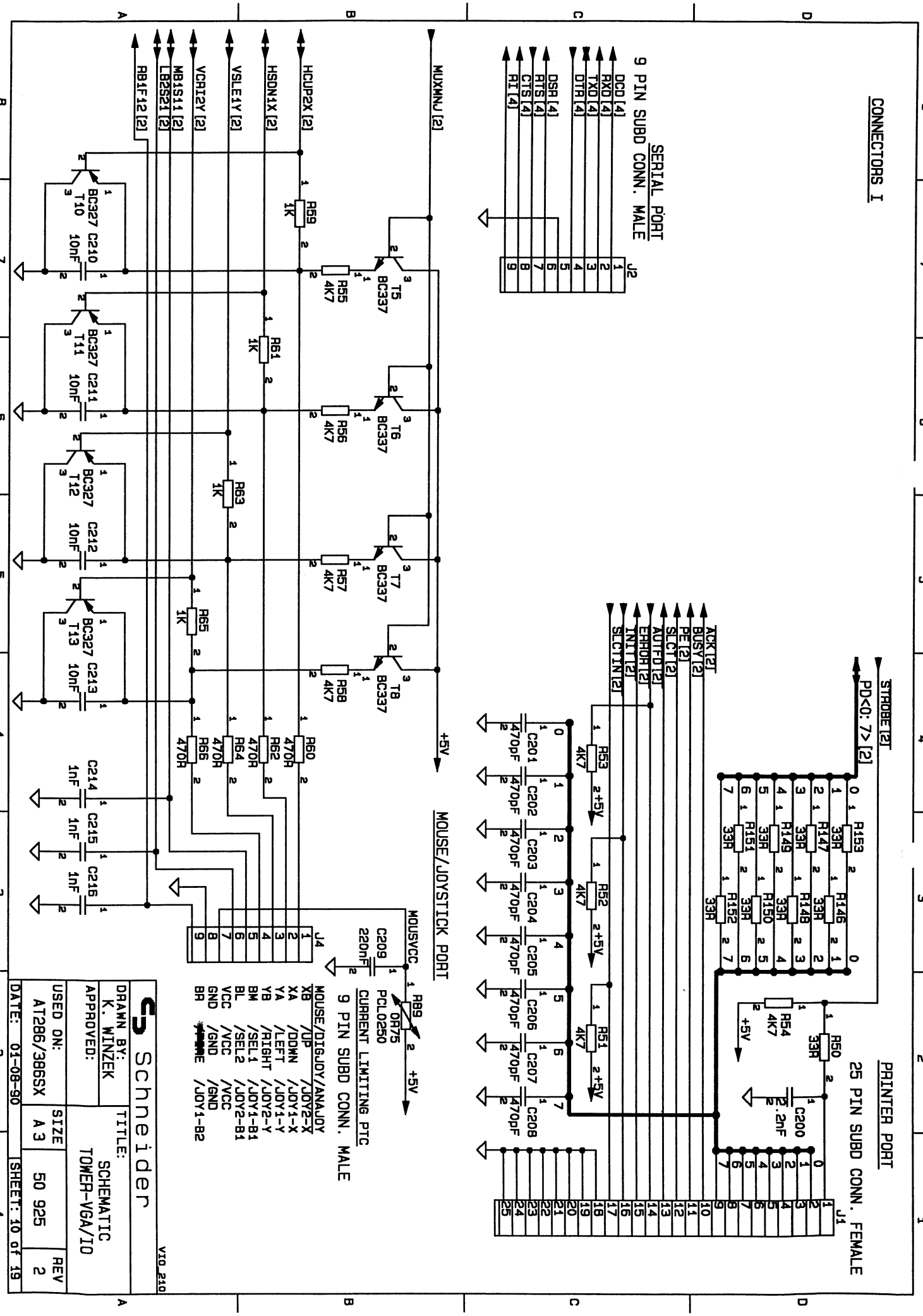
NOTES:
1) AVSS IS ANALOG GROUND
2) AVDD IS ANALOG POWER
3) OSC3-6, U20 AND U21, Q3, C116-118, C122-C124, R29-33, ARE ALTERNATIVES
4) U21, Q3, C116-118, C122-C124, R29-33 NOT USED
5) C124 IS TANTAL TYPE

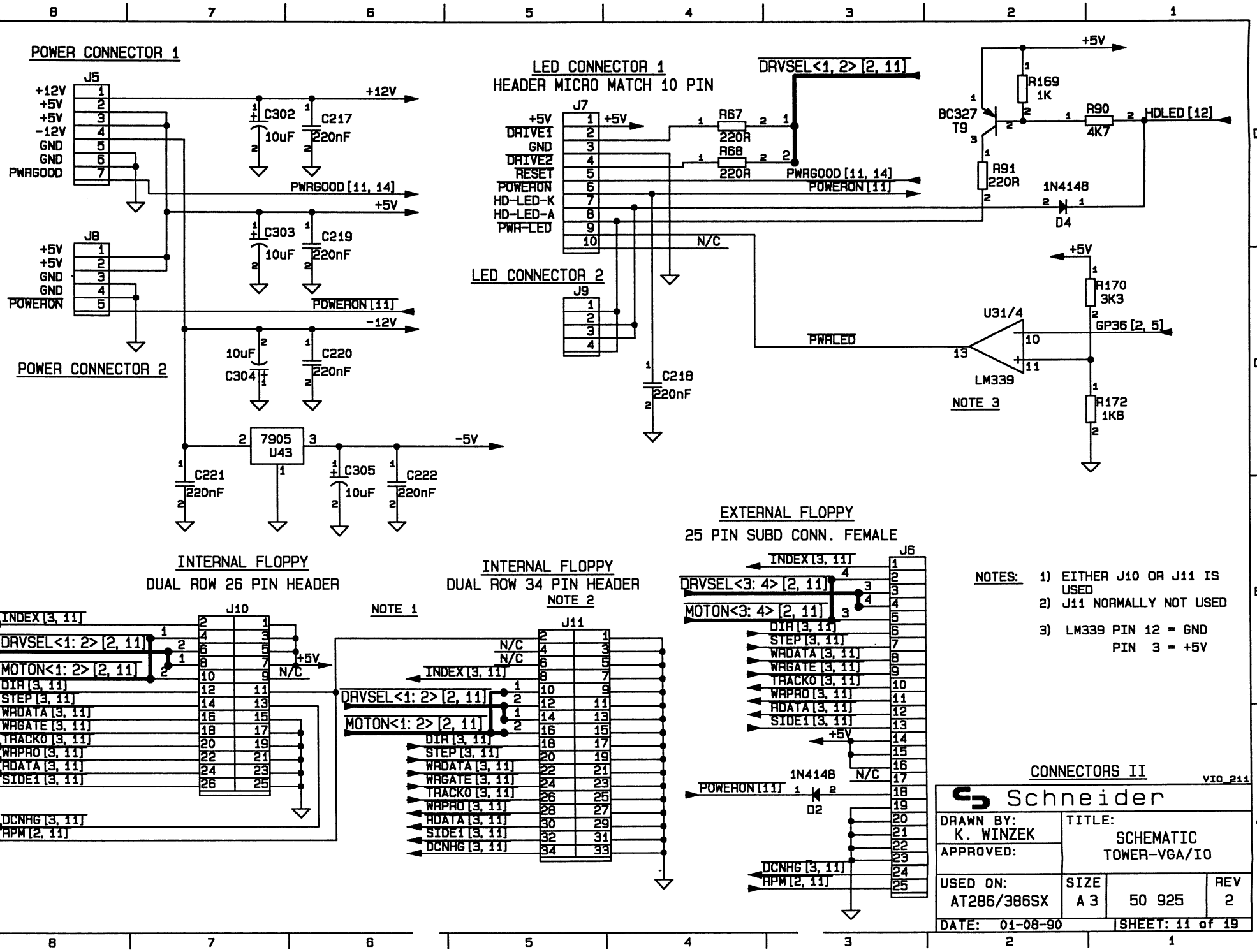
VIO_27

Schneider			
DRAWN BY: K. WINZEK	TITLE: SCHEMATIC TOWER-VGA/IO		
APPROVED:			
USED ON: AT286/386SX	SIZE A 3	50 925	REV 2
DATE: 01-09-90	SHEET: 7 of 19		

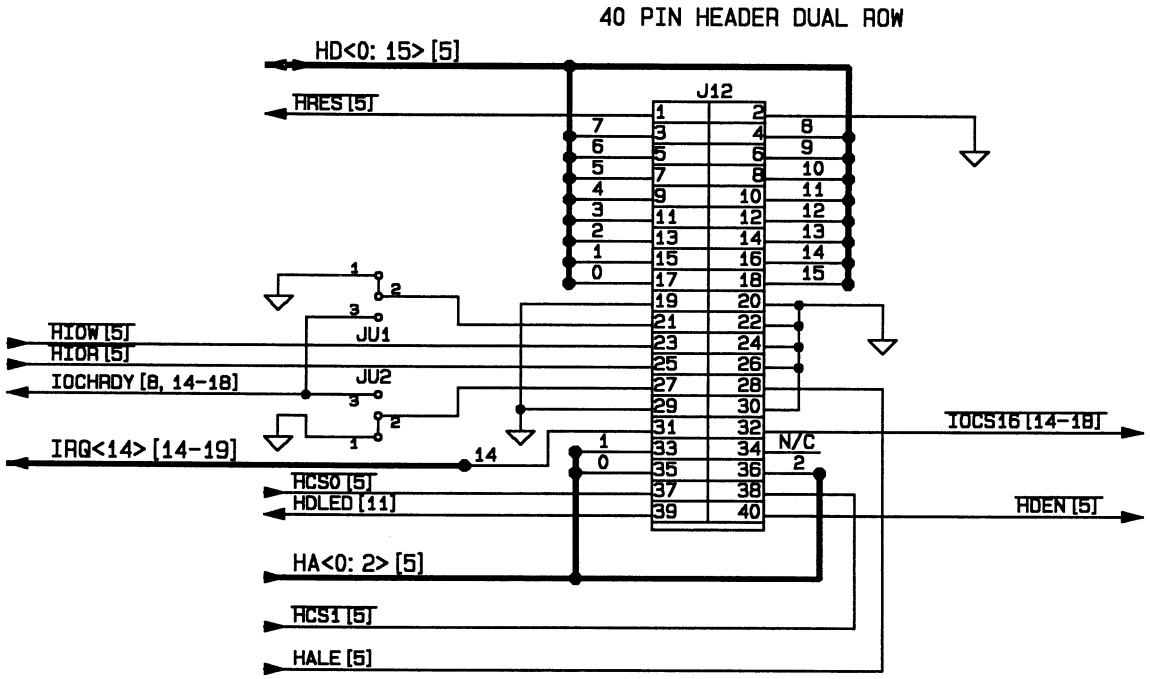

VGA CONTROLLER
ATI18800
U29
VCC = 25, 50, 56, 75, 100
GND = 13, 38, 63, 76, 88
IMSG176
U30
VSS-14
NOTE 1
NOTE 2
NOTES: 1) LM339: GND=12, VCC=3
2) C300, C301 ARE TANTAL TYPE
Schneider
DRAWN BY: K. WINZEK
APPROVED:
TITLE: SCHEMATIC TOWER-VGA/IO
USED ON: AT286/386SX
SIZE A 3
50 228
REV 2
DATE: 01-09-90
SHEET: 8 of 19
VIO_28


VIDEO RAM
VAD0<0: 7> [8, 13]
VAD1<0: 7> [8, 13]
VAD2<0: 7> [8, 13]
VAD3<0: 7> [8, 13]
41464
U33
U34
U35
U36
U37
U38
U39
U40
RAS [8]
CAS [8]
OE01 [8]
OE23 [8]
WE<0: 3> [8]
R100
R101
R102
R103
33R
TRAS [13]
TCAS [13]
TOE23 [13]
4K7
RN13
+5V
NMC9306N
U41
AA8 [8]
NOTE 1
F241
U42
R104
R105
R106
R107
R108
R109
R110
R112
TWE<4: 7> [13]
C127
C128
C129
C130
47pF
R49
1K
NOTES: 1) NMC9306 IS EEPROM
Schneider
DRAWN BY: K. WINZEK
APPROVED:
TITLE: SCHEMATIC TOWER-VGA/IO
USED ON: AT286/386SX
SIZE A 3
50 925
REV 2
DATE: 01-08-90
SHEET: 9 of 19
VIO_29


CONNECTORS I
SERIAL PORT
9 PIN SUBD CONN. MALE
DCD [4]
RXD [4]
TXD [4]
DTR [4]
DSR [4]
RTS [4]
CTS [4]
RI [4]
J2
PRINTER PORT
25 PIN SUBD CONN. FEMALE
STROBE [2]
PD<0:7> [2]
ACK [2]
BUSY [2]
PE [2]
SLCT [2]
AUTFD [2]
ERROR [2]
INIT [2]
SLCTIN [2]
J1
MOUSE/JOYSTICK PORT
9 PIN SUBD CONN. MALE
CURRENT LIMITING PTC
MOUSVCC
MUXMNJ [2]
HCUP2X [2]
HSDN1X [2]
VSLE1Y [2]
VCRI2Y [2]
MB1S11 [2]
LB2S21 [2]
RB1F12 [2]
MOUSE/DIGJOY/ANAJOY
XB /UP /JOY2-X
XA /DOWN /JOY1-X
YA /LEFT /JOY1-Y
YB /RIGHT /JOY2-Y
BM /SEL1 /JOY1-B1
BL /SEL2 /JOY2-B1
VCC /VCC /VCC
GND /GND /GND
BR /JOY1-B2
J4
Schneider
DRAWN BY: K. WINZEK
APPROVED:
TITLE: SCHEMATIC TOWER-VGA/IO
USED ON: AT286/386SX
SIZE A 3
REV 2
DATE: 01-08-90
SHEET: 10 of 19
VIO_210


POWER CONNECTOR 1
J5
+12V
+5V
+5V
-12V
GND
GND
PWRGOOD
C302
10uF
C217
220nF
+12V
PWRGOOD [11, 14]
+5V
J8
+5V
+5V
GND
GND
POWERON
C303
10uF
C219
220nF
POWERON [11]
-12V
POWER CONNECTOR 2
10uF
C304
C220
220nF
7905
U43
-5V
C221
220nF
C305
10uF
C222
220nF
LED CONNECTOR 1
HEADER MICRO MATCH 10 PIN
J7
+5V
DRIVE1
GND
DRIVE2
RESET
POWERON
HD-LED-K
HD-LED-A
PWR-LED
DRVSEL<1, 2> [2, 11]
R67
220R
R68
220R
PWRGOOD [11, 14]
POWERON [11]
N/C
LED CONNECTOR 2
J9
C218
220nF
PWRLED
+5V
R169
1K
BC327
T9
R90
4K7
HDLED [12]
R91
220R
1N4148
D4
+5V
R170
3K3
U31/4
GP36 [2, 5]
LM339
NOTE 3
R172
1K8
INTERNAL FLOPPY
DUAL ROW 26 PIN HEADER
J10
INDEX [3, 11]
DRVSEL<1: 2> [2, 11]
MOTON<1: 2> [2, 11]
DIR [3, 11]
STEP [3, 11]
WRDATA [3, 11]
WRGATE [3, 11]
TRACK0 [3, 11]
WRPRO [3, 11]
RDATA [3, 11]
SIDE1 [3, 11]
+5V
N/C
DCNHG [3, 11]
RPM [2, 11]
NOTE 1
INTERNAL FLOPPY
DUAL ROW 34 PIN HEADER
NOTE 2
J11
N/C
N/C
INDEX [3, 11]
DRVSEL<1: 2> [2, 11]
MOTON<1: 2> [2, 11]
DIR [3, 11]
STEP [3, 11]
WRDATA [3, 11]
WRGATE [3, 11]
TRACK0 [3, 11]
WRPRO [3, 11]
RDATA [3, 11]
SIDE1 [3, 11]
DCNHG [3, 11]
EXTERNAL FLOPPY
25 PIN SUBD CONN. FEMALE
J6
INDEX [3, 11]
DRVSEL<3: 4> [2, 11]
MOTON<3: 4> [2, 11]
DIR [3, 11]
STEP [3, 11]
WRDATA [3, 11]
WRGATE [3, 11]
TRACK0 [3, 11]
WRPRO [3, 11]
RDATA [3, 11]
SIDE1 [3, 11]
+5V
1N4148
N/C
POWERON [11]
D2
DCNHG [3, 11]
RPM [2, 11]
NOTES: 1) EITHER J10 OR J11 IS USED
2) J11 NORMALLY NOT USED
3) LM339 PIN 12 = GND
PIN 3 = +5V
CONNECTORS II
VIO_211
Schneider
DRAWN BY: K. WINZEK
APPROVED:
TITLE: SCHEMATIC TOWER-VGA/IO
USED ON: AT286/386SX
SIZE A 3
50 925
REV 2
DATE: 01-08-90
SHEET: 11 of 19

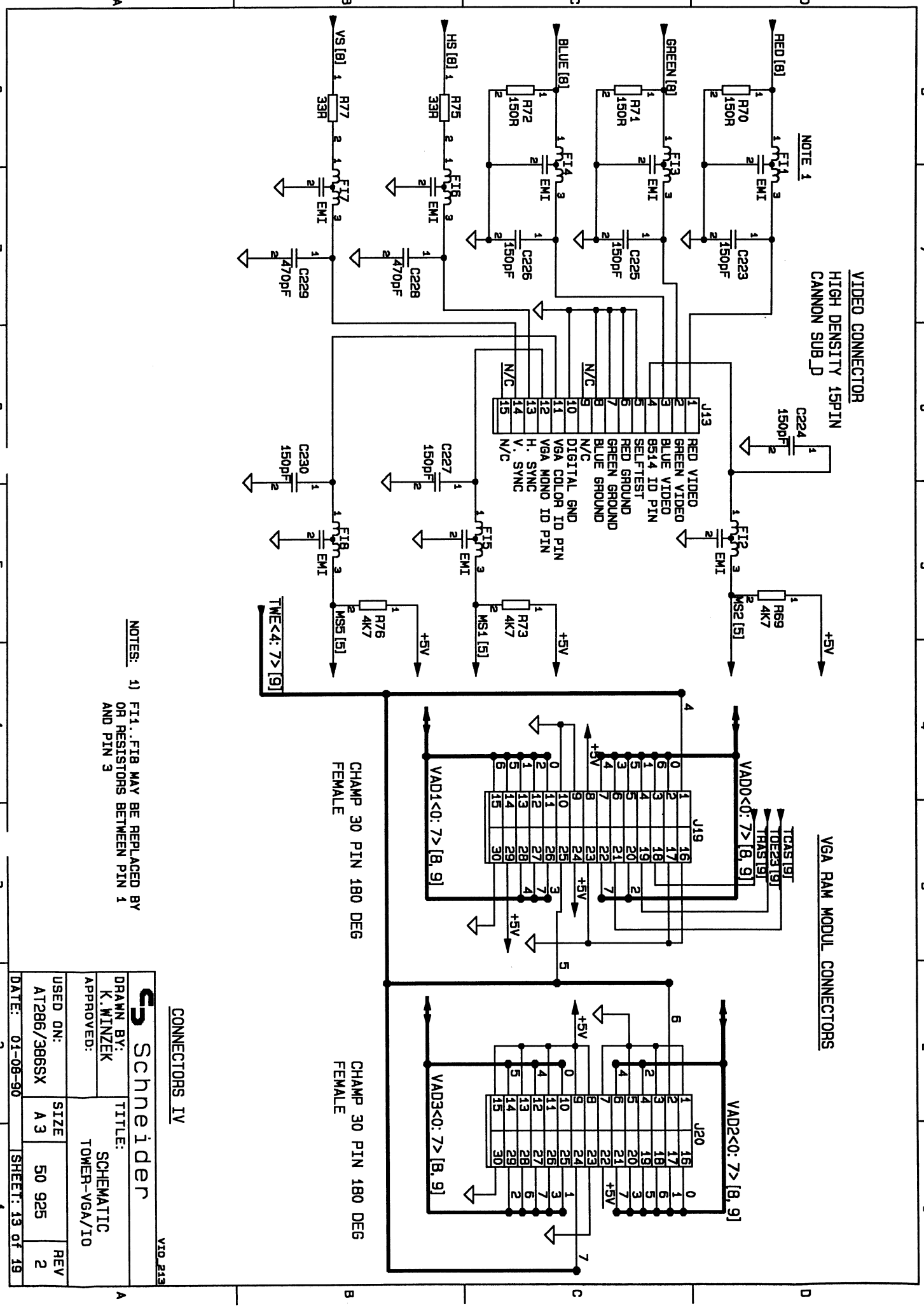
AT INTEGRATED DRIVE CONNECTOR

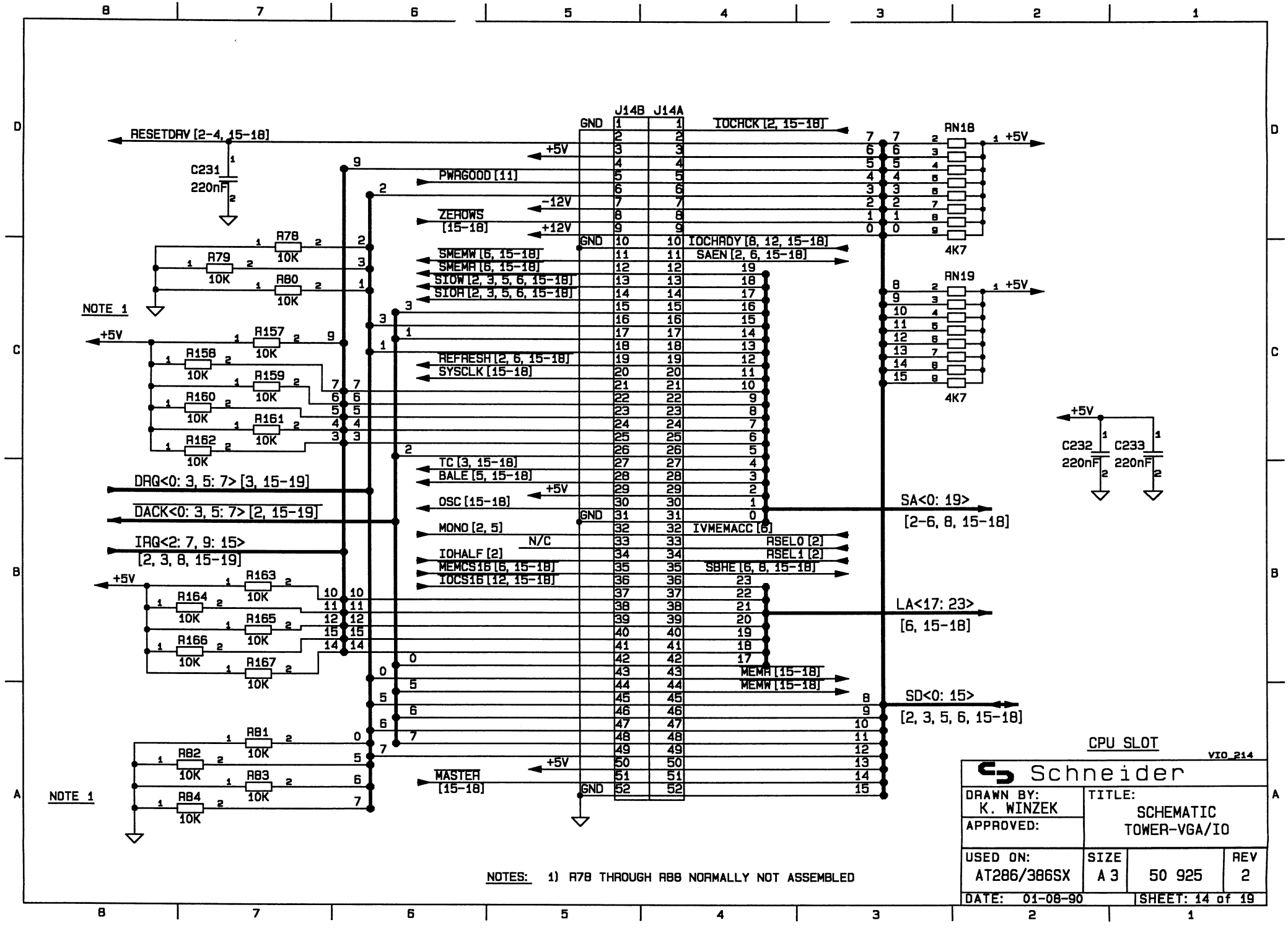


CONNECTORS III

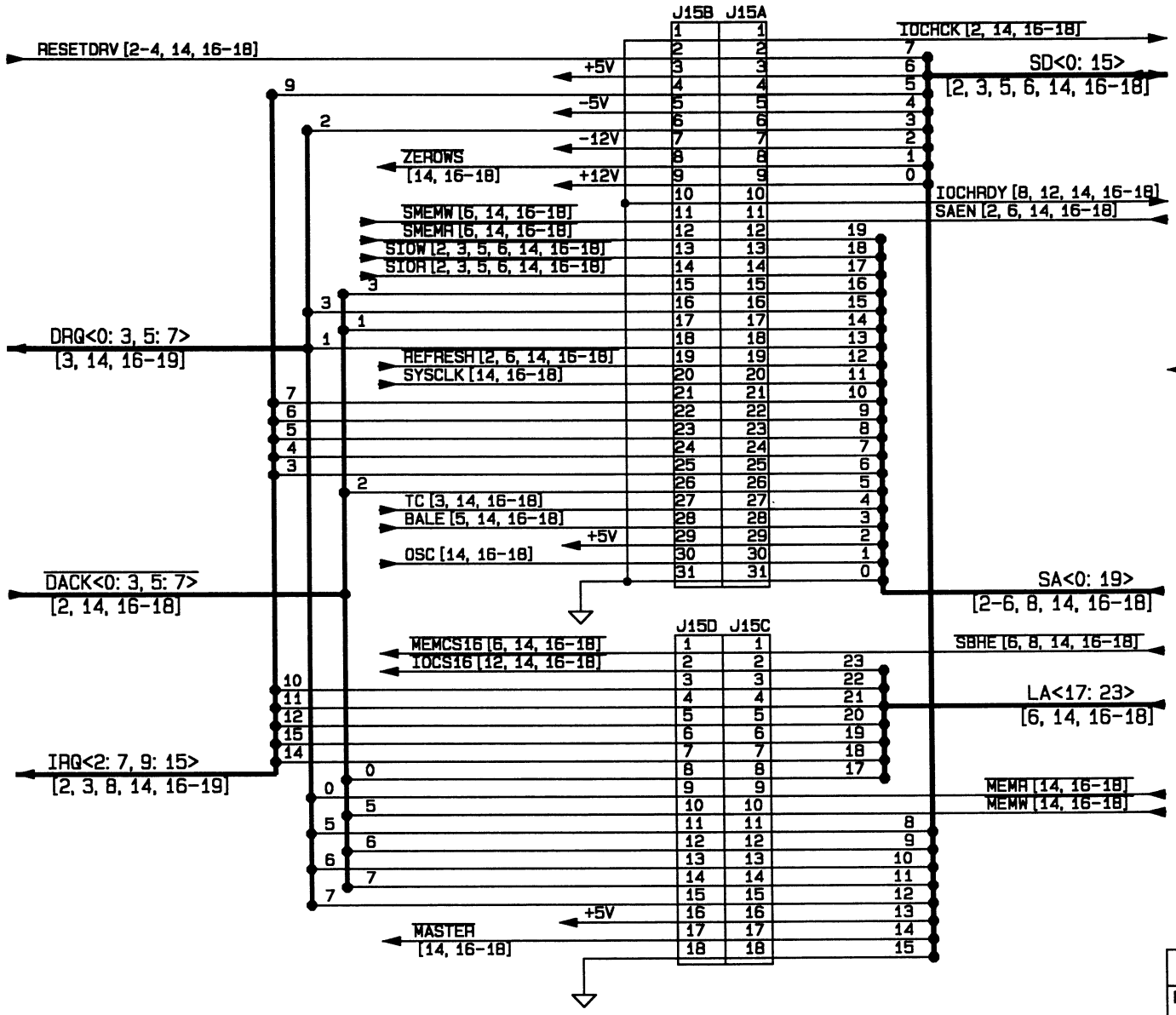
VIO_212

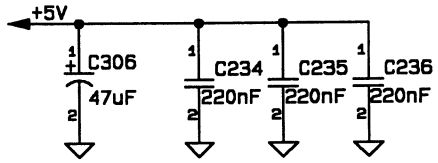
Schneider			
DRAWN BY: K. WINZEK	TITLE: SCHEMATIC TOWER-VGA/IO		
APPROVED:			
USED ON: AT286/386SX	SIZE A 3	50 925	REV 2
DATE: 01-05-90	SHEET: 12 of 19		


VIDEO CONNECTOR
HIGH DENSITY 15PIN
CANNON SUB_D
NOTE 1
RED [8]
GREEN [8]
BLUE [8]
HS [8]
VS [8]
R70 150R
R71 150R
R72 150R
R75 33R
R77 33R
C223 150pF
C225 150pF
C226 150pF
C228 470pF
C229 470pF
C224 150pF
C227 150pF
C230 150pF
FI1
FI2
FI3
FI4
FI5
FI6
FI7
FI8
EMI
J13
RED VIDEO
GREEN VIDEO
BLUE VIDEO
8514 ID PIN
SELFTEST
RED GROUND
GREEN GROUND
BLUE GROUND
N/C
DIGITAL GND
VGA COLOR ID PIN
VGA MONO ID PIN
H. SYNC
V. SYNC
N/C
R69 4K7
R73 4K7
R76 4K7
MS2 [5]
MS1 [5]
MS5 [5]
+5V
TWE<4: 7> [9]
VGA RAM MODUL CONNECTORS
TCAS [9]
TOE23 [9]
TRAS [9]
VAD0<0: 7> [8, 9]
VAD1<0: 7> [8, 9]
VAD2<0: 7> [8, 9]
VAD3<0: 7> [8, 9]
J19
J20
CHAMP 30 PIN 180 DEG
FEMALE
CHAMP 30 PIN 180 DEG
FEMALE
NOTES: 1) FI1..FI8 MAY BE REPLACED BY
OR RESISTORS BETWEEN PIN 1
AND PIN 3
CONNECTORS IV
Schneider
VIO_213
DRAWN BY: K.WINZEK
APPROVED:
TITLE: SCHEMATIC
TOWER-VGA/IO
USED ON: AT286/386SX
SIZE A 3
50 925
REV 2
DATE: 01-08-90
SHEET: 13 of 19



NOTES: 1) R78 THROUGH R88 NORMALLY NOT ASSEMBLED



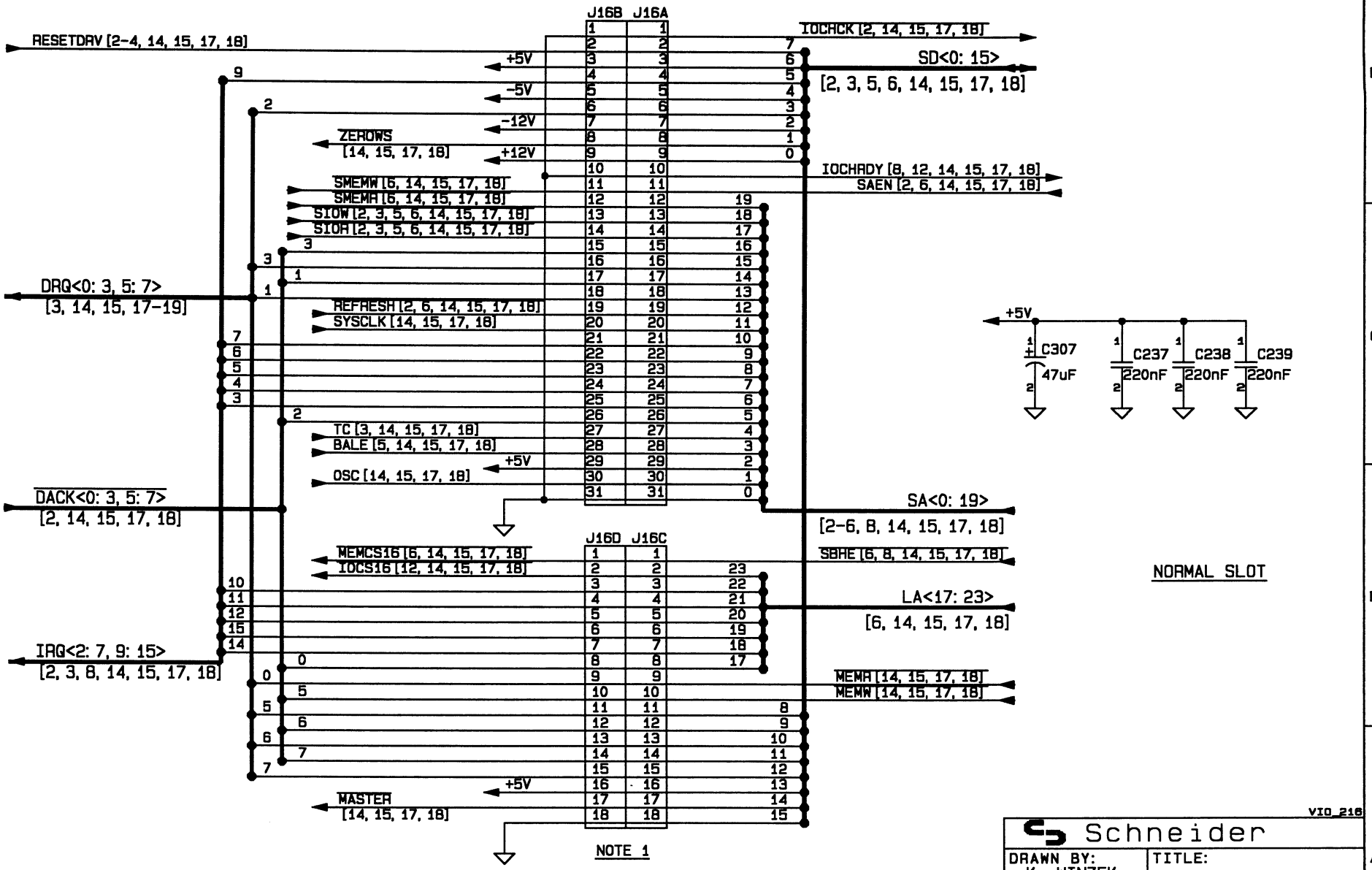


NORMAL SLOT

VIO_215

Schneider

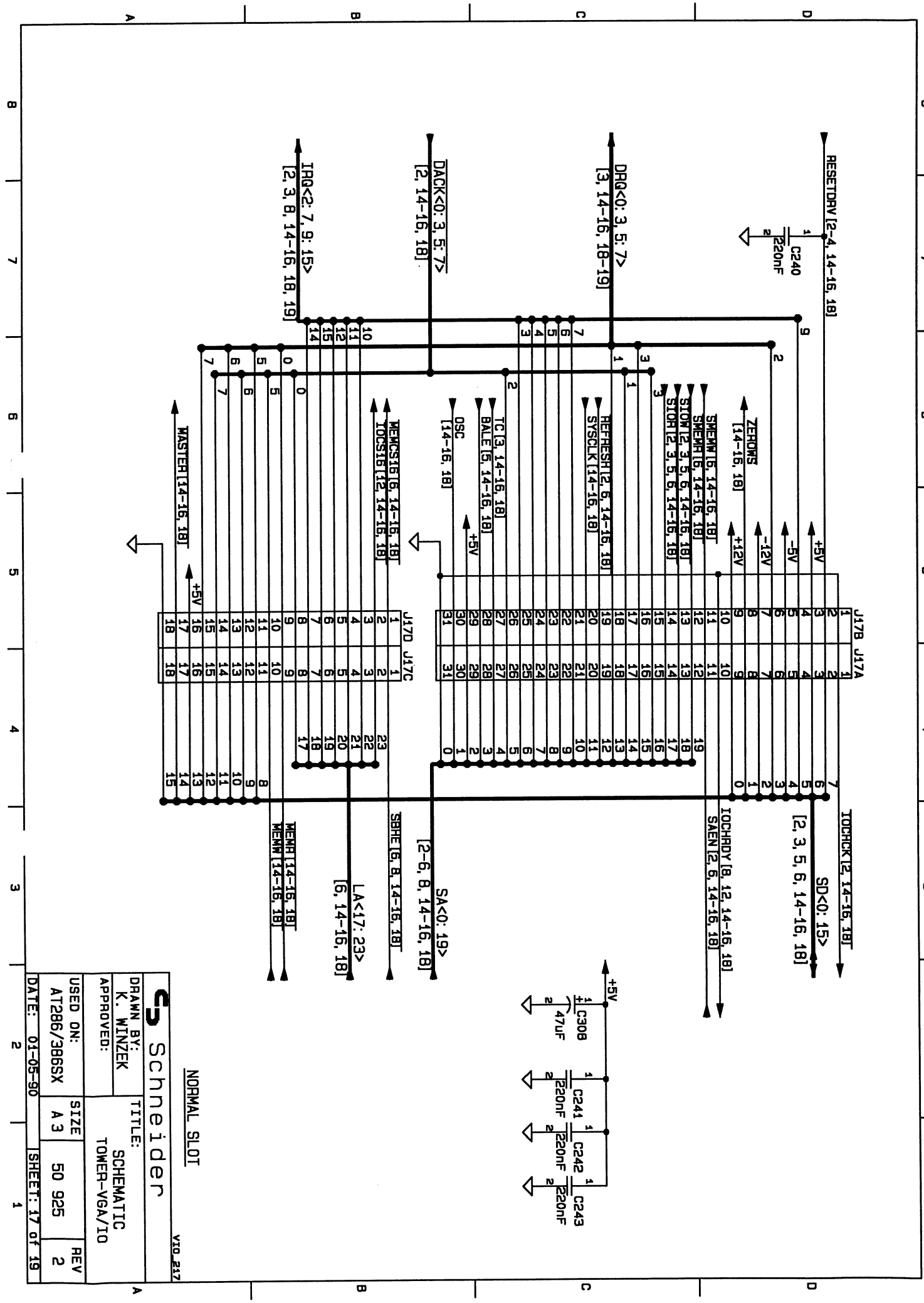
DRAWN BY: K. WINZEK	TITLE: SCHEMATIC TOWER-VGA/IO		
APPROVED:			
USED ON: AT286/386SX	SIZE A 3	50 925	REV 2
DATE: 01-05-90	SHEET: 15 of 19		

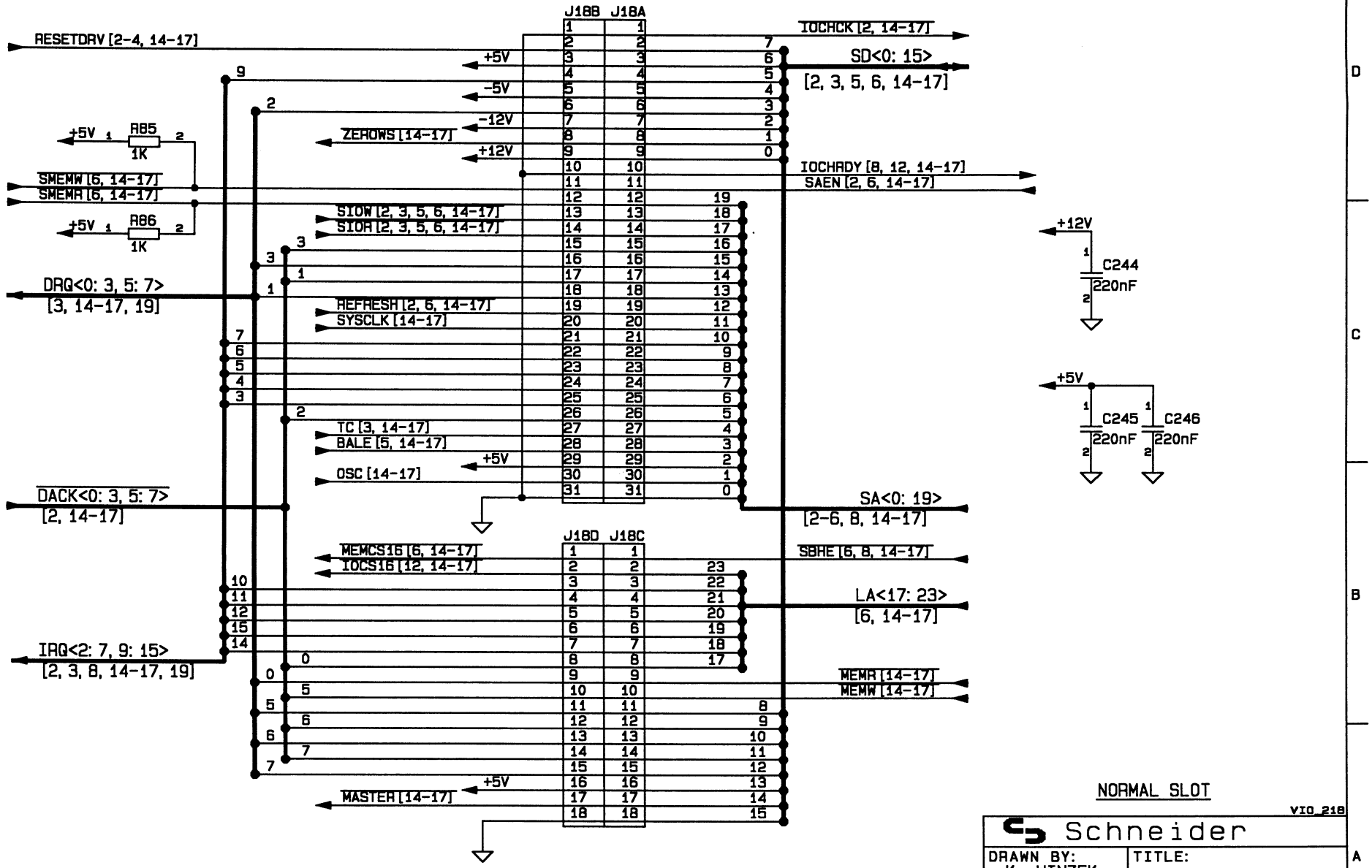


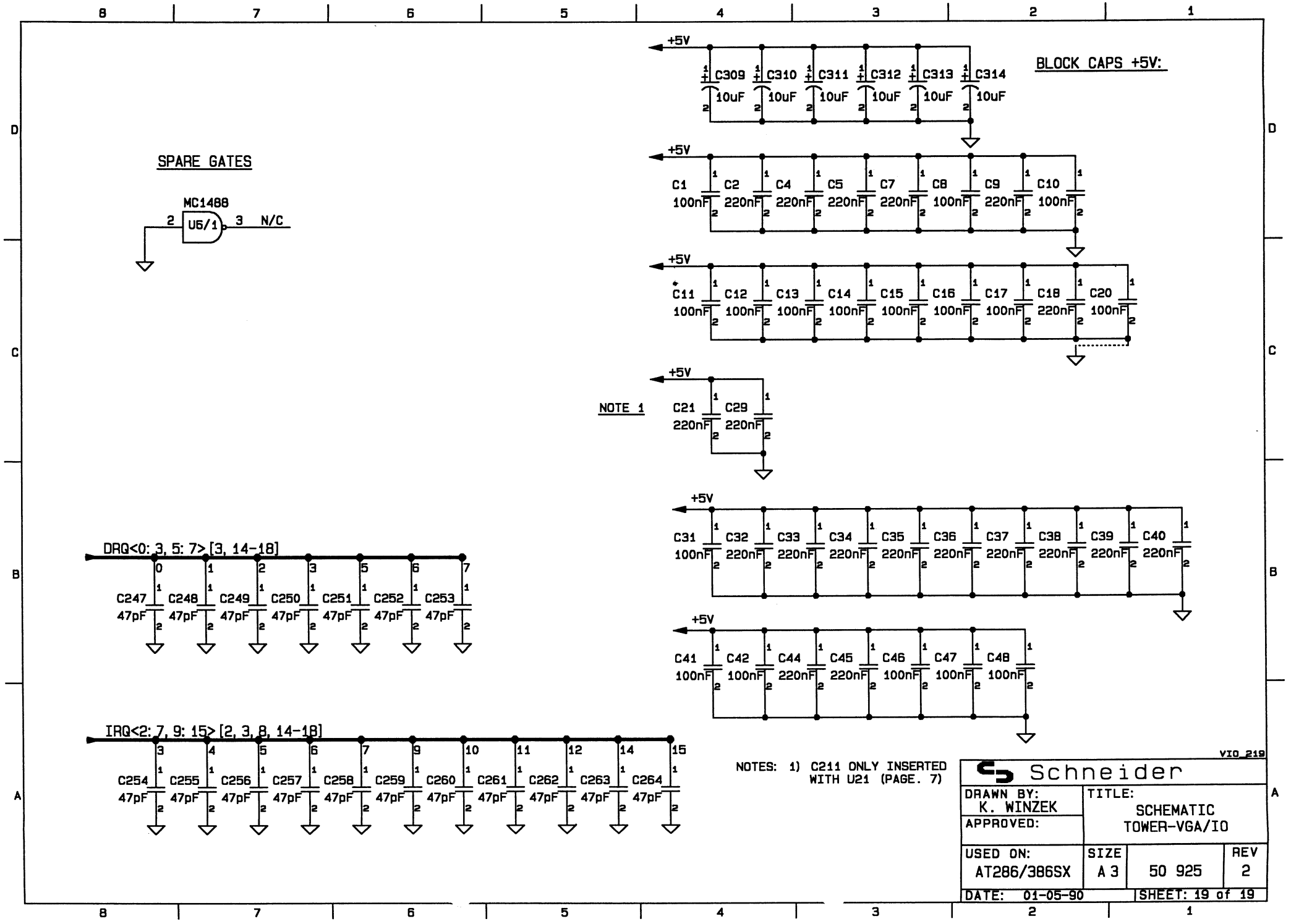
NOTES: 1) CARD EDGE CONNECTOR J16C-D NOT ASSEMBLED

Schneider			
DRAWN BY: K. WINZEK	TITLE: SCHEMATIC TOWER-VGA/IO		
APPROVED:			
USED ON: AT286/386SX	SIZE A 3	50 925	REV 2
DATE: 01-05-90	SHEET: 16 of 19		

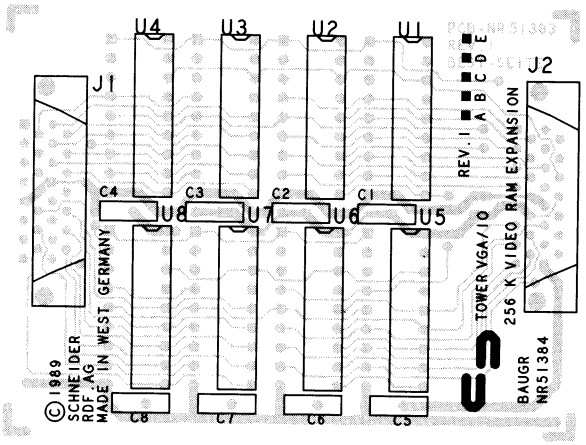
VIO_216


RESETDRV [2-4, 14-16, 18]
C240 220nF
DRQ<0: 3, 5: 7> [3, 14-16, 18-19]
DACK<0: 3, 5: 7> [2, 14-16, 18]
IRQ<2: 7, 9: 15> [2, 3, 8, 14-16, 18, 19]
MASTER [14-16, 18]
ZEROWS [14-16, 18]
SMEMW [5, 14-16, 18]
SMEMR [5, 14-16, 18]
SIOW [2, 3, 5, 6, 14-16, 18]
SIOR [2, 3, 5, 6, 14-16, 18]
REFRESH [2, 6, 14-16, 18]
SYSCLK [14-16, 18]
TC [3, 14-16, 18]
BALE [5, 14-16, 18]
OSC [14-16, 18]
MEMCS16 [6, 14-16, 18]
IOCS16 [12, 14-16, 18]
+5V
-5V
+12V
-12V
J17B J17A
J17D J17C
IOCHCK [2, 14-16, 18]
SD<0: 15> [2, 3, 5, 6, 14-16, 18]
IOCHRDY [8, 12, 14-16, 18]
SAEN [2, 6, 14-16, 18]
SA<0: 19> [2-6, 8, 14-16, 18]
LA<17: 23> [6, 14-16, 18]
SBHE [6, 8, 14-16, 18]
MEMR [14-16, 18]
MEMW [14-16, 18]
C30B 47uF
C241 220nF
C242 220nF
C243 220nF
NORMAL SLOT
Schneider
DRAWN BY: K. WINZEK
APPROVED:
TITLE: SCHEMATIC TOWER-VGA/IO
USED ON: AT286/386SX
SIZE A 3
50 925
REV 2
DATE: 01-05-90
SHEET: 17 of 19
VIO_217

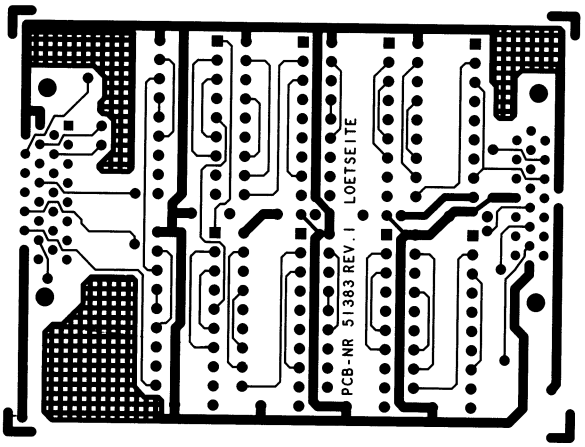

J18B J18A
J18D J18C
RESETDRV [2-4, 14-17]
+5V
-5V
-12V
+12V
ZEROWS [14-17]
IOCHCK [2, 14-17]
SD<0: 15>
[2, 3, 5, 6, 14-17]
IOCHRDY [8, 12, 14-17]
SAEN [2, 6, 14-17]
R85
1K
R86
1K
SMEMW [6, 14-17]
SMEMR [6, 14-17]
SIOW [2, 3, 5, 6, 14-17]
SIOR [2, 3, 5, 6, 14-17]
DRQ<0: 3, 5: 7>
[3, 14-17, 19]
REFRESH [2, 6, 14-17]
SYSCLK [14-17]
TC [3, 14-17]
BALE [5, 14-17]
OSC [14-17]
DACK<0: 3, 5: 7>
[2, 14-17]
SA<0: 19>
[2-6, 8, 14-17]
MEMCS16 [6, 14-17]
IOCS16 [12, 14-17]
SBHE [6, 8, 14-17]
LA<17: 23>
[6, 14-17]
IRQ<2: 7, 9: 15>
[2, 3, 8, 14-17, 19]
MEMR [14-17]
MEMW [14-17]
MASTER [14-17]
C244
220nF
C245
220nF
C246
220nF
NORMAL SLOT
VIO_218
Schneider
DRAWN BY: K. WINZEK
APPROVED:
TITLE: SCHEMATIC TOWER-VGA/IO
USED ON: AT286/386SX
SIZE A 3
50 925
REV 2
DATE: 01-05-90
SHEET: 18 of 19


SPARE GATES
MC1488
2
U6/1
3
N/C
BLOCK CAPS +5V:
+5V
C309 10uF
C310 10uF
C311 10uF
C312 10uF
C313 10uF
C314 10uF
C1 100nF
C2 220nF
C4 220nF
C5 220nF
C7 220nF
C8 100nF
C9 220nF
C10 100nF
C11 100nF
C12 100nF
C13 100nF
C14 100nF
C15 100nF
C16 100nF
C17 100nF
C18 220nF
C20 100nF
NOTE 1
C21 220nF
C29 220nF
C31 100nF
C32 220nF
C33 220nF
C34 220nF
C35 220nF
C36 220nF
C37 220nF
C38 220nF
C39 220nF
C40 220nF
C41 100nF
C42 100nF
C44 220nF
C45 220nF
C46 100nF
C47 100nF
C48 100nF
DRQ<0: 3, 5: 7> [3, 14-18]
C247 47pF
C248 47pF
C249 47pF
C250 47pF
C251 47pF
C252 47pF
C253 47pF
IRQ<2: 7, 9: 15> [2, 3, 8, 14-18]
C254 47pF
C255 47pF
C256 47pF
C257 47pF
C258 47pF
C259 47pF
C260 47pF
C261 47pF
C262 47pF
C263 47pF
C264 47pF
NOTES: 1) C211 ONLY INSERTED WITH U21 (PAGE. 7)
VIO_219
Schneider
DRAWN BY: K. WINZEK
APPROVED:
TITLE: SCHEMATIC TOWER-VGA/IO
USED ON: AT286/386SX
SIZE A 3
50 925
REV 2
DATE: 01-05-90
SHEET: 19 of 19

Option VGA/RAM-Modul
Component side



Soldering side



Ersatzteilliste für VGA/RAM-Modul
Parts List for VGA/RAM-Modul

Best.-Nr. Part.-No.	Bezeichnung	Description	Zeich.-Pos. Ref.-No.	Preisgruppe
51 384 00	VGA/RAM-Modul	VGA/RAM-Modul		F 7
50 118 00	IC 41464-10 DRAM 64 K×4 100nS	IC 41464-10 DRAM 64 K×4 100nS	U 1–8	C 7
51 519 00	Steckverb. CHAMP 30pol.	Socket CHAMP 30-pin		B 2

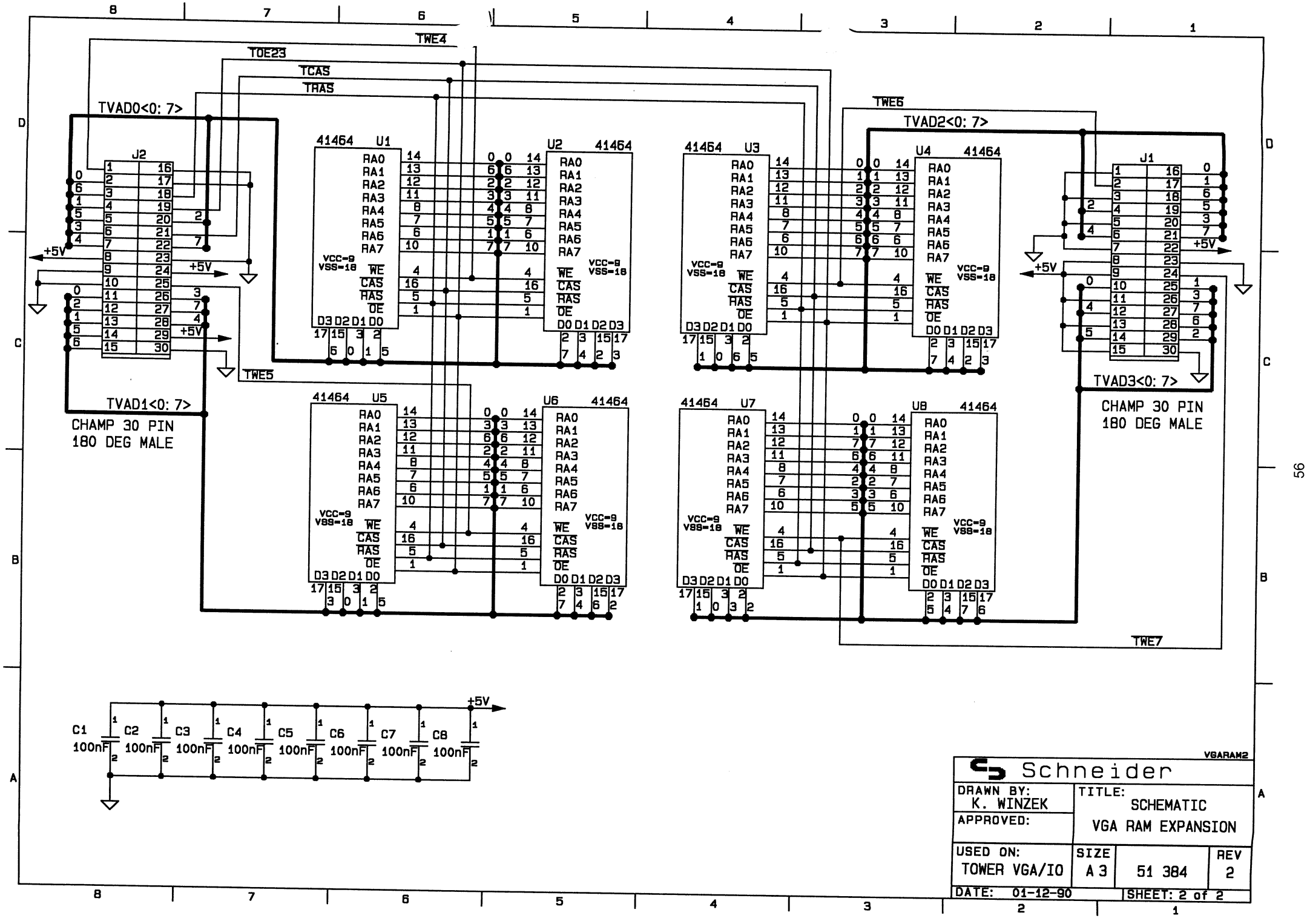
REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
1	ADVANCED ENGINEERING RELEASE	07-17-89	
2	NEW RAM MODUL CONNECTORS (PCB REV.1)	01-10-90	K. WINZEK

DRAWING FILES:	CONTENTS:
VGARAM1.DWG	THIS SHEET
VGARAM2.DWG	VGA RAM EXPANSION

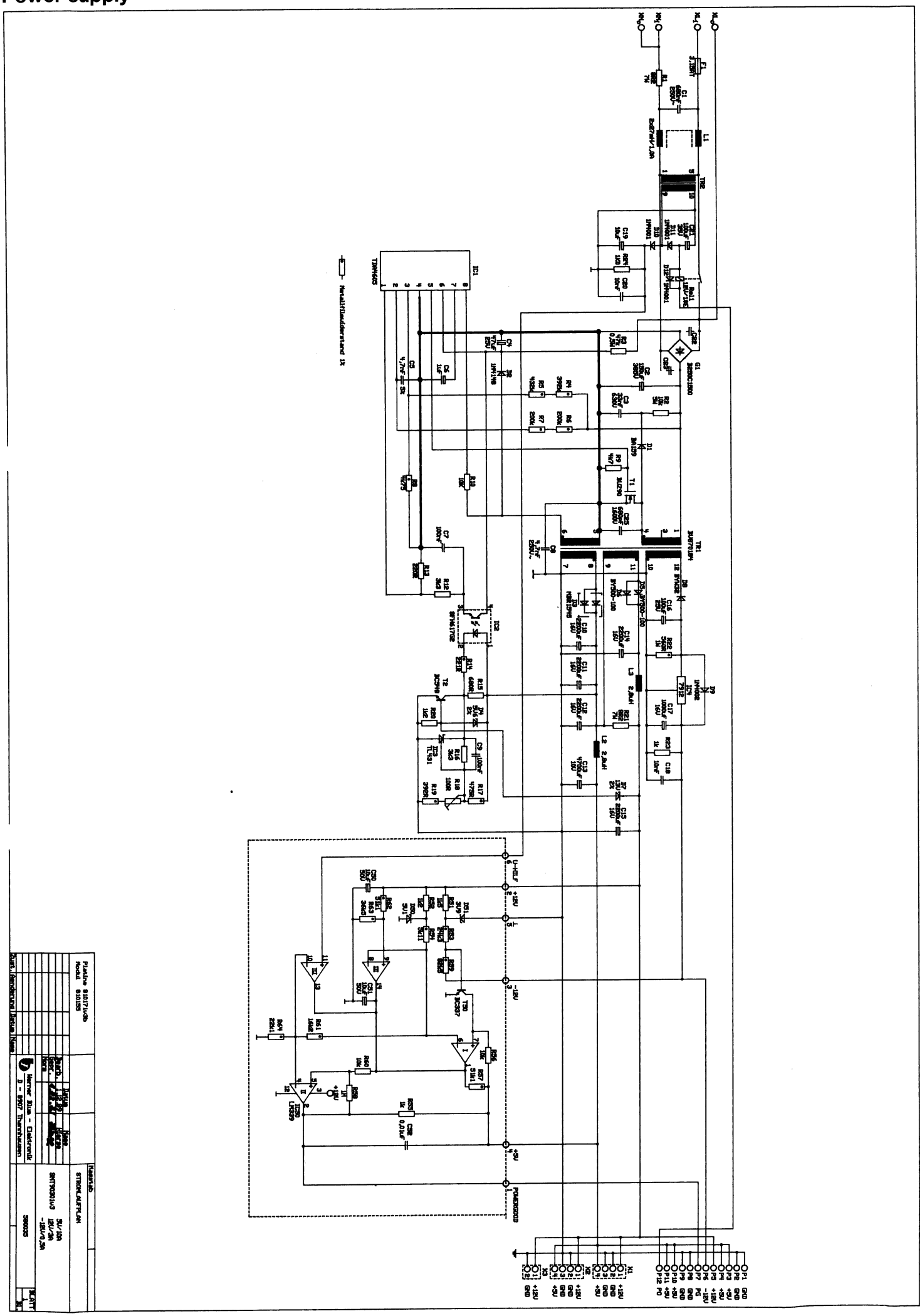
VGARAM1

Schneider

DRAWN BY: K. WINZEK	TITLE: SCHEMATIC VGA RAM EXPANSION		
APPROVED:			
USED ON: TOWER VGA/IO	SIZE A 3	51 384	REV 2
DATE: 01-12-90		SHEET: 1 of 2	

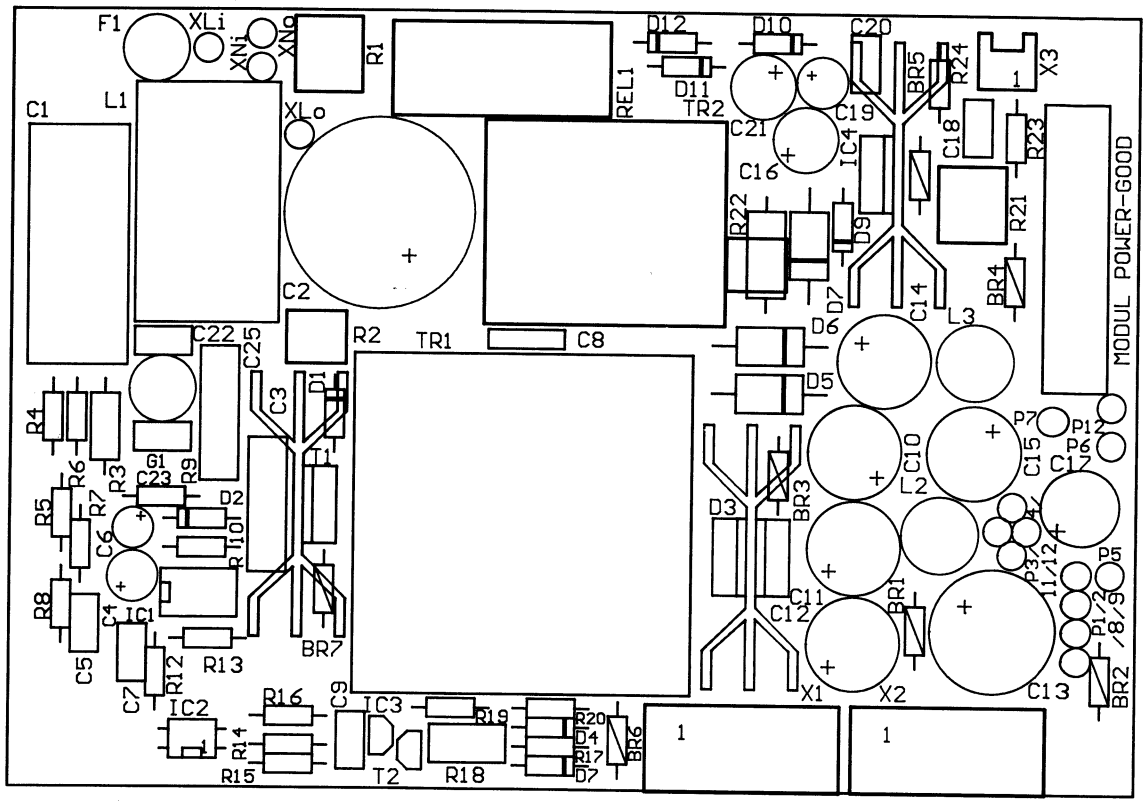

TWE4
TOE23
TCAS
TRAS
TVAD0<0: 7>
TVAD1<0: 7>
TVAD2<0: 7>
TVAD3<0: 7>
TWE5
TWE6
TWE7
+5V
J2
J1
41464 U1
41464 U2
41464 U3
41464 U4
41464 U5
41464 U6
41464 U7
41464 U8
RA0
RA1
RA2
RA3
RA4
RA5
RA6
RA7
WE
CAS
RAS
OE
D3 D2 D1 D0
D0 D1 D2 D3
VCC=9
VSS=18
CHAMP 30 PIN
180 DEG MALE
C1 100nF
C2 100nF
C3 100nF
C4 100nF
C5 100nF
C6 100nF
C7 100nF
C8 100nF
Schneider
VGARAM2
DRAWN BY: K. WINZEK
APPROVED:
TITLE: SCHEMATIC
VGA RAM EXPANSION
USED ON: TOWER VGA/IO
SIZE A 3
51 384
REV 2
DATE: 01-12-90
SHEET: 2 of 2

Schematic diagram
Power supply



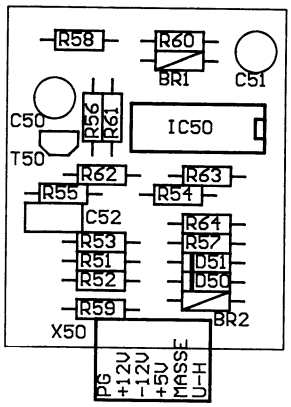
Power supply
Component side

SNT90301 Fa. Schneider
Ident.-Nr.: 810171V3b
Groesse: 149,5*103mm



Modul
Power supply

Modul Power-Good fuer SNT 60301/90301
Ident.-Nr.: 810155
Groesse: 38*45 mm



Error Code Table for VGA AT

The "DIAGNP OUTPUT" codes are placed at the diagnostic status port to indicate tests in progress and failed tests to someone with hardware which can detect the output. If the FAILBEEP option is selected, the "BEEP CODES" are announced on the speaker if and only if a fatal failure is detected. For instance, "2-1-4" (a burst of two beeps, a single beep, a burst of four beeps) indicates a failure of bit 3 in the first 64K of RAM. Both set of codes are only used prior to screen initialization and screen retrace verification.

Once the screen is believed operable, any diagnostic reporting is via screen messages, except if MANLOOP EQU TRUE and the jumpers say to loop on POST. In this case, it is assumed that no video adapter is attached and some additional errors will be reported via DIAGNP and the speaker.

```
DIAGNP  BEEP          DESCRIPTION OF
OUTPUT CODES        TEST OR FAILURE
  |       |                 |
01h ;         80286 register test in-progress
02h ; 1-1-3   CMOS write/read test in-progress or failure
03h ; 1-1-4   BIOS ROM checksum in-progress or failure
04h ; 1-2-1   Programmable Interval Timer test in-progress or failure
05h ; 1-2-2   DMA initialization in-progress or failure
06h ; 1-2-3   DMA page register write/read test in-progress or fail
07h ; 1-2-4   JIM port address offset determination in-progress or not found
08h ; 1-3-1   RAM refresh verification in-progress or failure
09h ;         1st 64K RAM test in-progress
0Ah ; 1-3-3   1st 64K RAM chip or data line failure - multi-bit
0Bh ; 1-3-4   1st 64K RAM odd/even logic failure
0Ch ; 1-4-1   1st 64K RAM address line failure
0Dh ; 1-4-2   1st 64K RAM parity test in_progress or failure
0Eh ; 1-4-3   invalid PBC ID                                    ;V2.00
10h ; 2-1-1   1st 64K RAM chip or data line failure - bit 0
11h ; 2-1-2   1st 64K RAM chip or data line failure - bit 1
12h ; 2-1-3   1st 64K RAM chip or data line failure - bit 2
13h ; 2-1-4   1st 64K RAM chip or data line failure - bit 3
14h ; 2-2-1   1st 64K RAM chip or data line failure - bit 4
15h ; 2-2-2   1st 64K RAM chip or data line failure - bit 5
16h ; 2-2-3   1st 64K RAM chip or data line failure - bit 6
17h ; 2-2-4   1st 64K RAM chip or data line failure - bit 7
18h ; 2-3-1   1st 64K RAM chip or data line failure - bit 8
19h ; 2-3-2   1st 64K RAM chip or data line failure - bit 9
1Ah ; 2-3-3   1st 64K RAM chip or data line failure - bit A
1Bh ; 2-3-4   1st 64K RAM chip or data line failure - bit B
1Ch ; 2-4-1   1st 64K RAM chip or data line failure - bit C
1Dh ; 2-4-2   1st 64K RAM chip or data line failure - bit D
1Eh ; 2-4-3   1st 64K RAM chip or data line failure - bit E
1Fh ; 2-4-4   1st 64K RAM chip or data line failure - bit F

20h ; 3-1-1   slave DMA register test in-progress or failure
21h ; 3-1-2   master DMA register test in-progress or failure
22h ; 3-1-3   master interrupt mask register test in-progress or fail
23h ; 3-1-4   slave interrupt mask register test in-progress or fail
25h ;         interrupt vector loading in-progress
27h ; 3-2-4   keyboard controller test in-progress or failure
28h ;         CMOS power-fail and checksum checks in-progress
29h ;         CMOS config info validation in-progress

2Ah ; 3-3-3   monitor type determination in-progress or failure
2Bh ; 3-3-4   screen memory test in-progress or failure
2Ch ; 3-4-1   screen initialization in-progress or failure
2Dh ; 3-4-2   screen retrace tests in-progress or failure
2Eh ;         search for video ROM in-progress
30h ;         screen believed operable:
```

```
30h ;         screen believed running w/ video ROM
31h ;         monochromatic screen believed operable
32h ;         40-column color screen believed operable
33h ;         80-column color screen believed operable

The following codes are reported via DIAGNP and the speaker only if
MANLOOP EQU TRUE and the "manufacturing jumper" indicates loop on POST.
Otherwise, these errors are reported via the screen and POST continues.
Use of the manufacturing jumper requires working correctly configured CMOS.
34h ; 4-2-1   timer tick interrupt test in_progress or failure
35h ; 4-2-2   shutdown test in_progress or failure
36h ; 4-2-3   gate A20 failure
37h ; 4-2-4   unexpected interrupt in protected mode
38h ; 4-3-1   RAM test in_progress or failure above address 0FFFFh
3Ah ; 4-3-3   Interval timer channel 2 test in_progress or failure
3Bh ; 4-3-4   Time-Of-Day clock test in_progress or failure
3Ch ; 4-4-1   Serial port test test in_progress or failure
3Dh ; 4-4-2   Parallel port test test in_progress or failure
3Eh ; 4-4-3   Math Coprocessor test in_progress or failure
```

********* ACHTUNG! *********

Für Daten aller Art, die sich bei Einsendung an die Firma Schneider im Servicefall oder in jedem anderen Fall noch auf einem Datenträger befinden, wird bei Verlust oder Beschädigung keinerlei Haftung übernommen!
Bitte, sichern Sie sich Ihre Daten vorher von Ihrem Datenträger. Wie man eine Sicherungskopie erstellt, können Sie in Ihrer MS-DOS-Betriebsanleitung nachlesen.

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We accept no responsibility for the loss of or damage to data of any kind which is still contained on a data carrier which is sent to Schneider for servicing or for any other reason!
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Bitte bei Ersatzteilbestellung die genaue Bezeichnung und Ident-Nr. (siehe Typenschild) des Gerätes sowie Bestell-Nummer und Positions-Nummer des Ersatzteils angeben.

For ordering of spare parts please state exact description and ident.-no. of unit (see silver rating label on the backside of unit) as well as part-no. and position-no. of required spare parts.

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